

# The Dental Digest.

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## Original Contributions.

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### HOW TO MAKE GOLD FILLINGS.

BY J. V. CONZETT, D.D.S., DUBUQUE, IOWA.

Gold foil has been the sheet anchor of all good operators ever since the art of filling teeth has been known to man, and many of the old operators, hampered as they were by the crude methods and instruments of their times, made very beautiful and lasting operations with this material. In these latter days we have been frequently told that the average life of a gold filling is three years, and we must confess with shame that the assertion has a great deal of truth in it. Not because of any inherent defect or lack of quality in the material itself, but because we have fallen upon a time in which men are not willing to pay the price that is demanded to make good gold operators. We are told that in these days men will take the line of the least resistance and that we cannot hope in the future to duplicate the great operators of the past because men will not be willing to devote the time and energy necessary to become good operators with gold foil, when the easier, though perhaps not so permanent, inlay method is possible for them to attain. If that is so, and I but quote the ideas, if not the words, of one of the most prominent dental educators in the Northwest, then woe is the future of the dental profession. If the time ever comes that any great proportion of our profession will be willing to adopt an easy method simply because it is easy, and be willing to pass up a good method simply because it is hard, then the period of our professional decadence has surely begun. For, as in any department of life, a man grows by overcoming obstacles, so in our profession by the mastering of the difficulties that present themselves will we become better dentists and better men. I firmly believe that the best filling that can be made in a tooth is a good gold filling, and I know equally well

that about the poorest filling that can be placed in a tooth is a *faulty gold filling*. And it is true that many men are turning away from the gold filling because of their inability to make a satisfactory filling with gold. One of the greatest inlay men in this country, and a warm personal friend of mine, said recently "the reason that I do not make gold fillings is because I have never been able to make one that I was satisfied with when it was finished."

Since the appearance of the article on "Gold Fillings" in the March (1908) DIGEST, written by the author of this article, I have received many letters upon the subject and the burden of them all was, "I know the value of the gold filling and would like to know how to make them; will you help me?" I said in that article that I believed that I could take a man of average ability and teach him to do the things with gold foil that I can do, and men have written me that they *have* average ability and have asked me to make good my assertion. I do not know that I can do that on paper, but if I can help any man to be a better operator, if I can influence any man to more carefully study the tremendous possibilities of gold foil in the saving of human teeth, I shall not have lived in vain. This, then, is my excuse for attempting to give to the profession some ideas upon the filling of teeth with gold.

#### PRELIMINARY OBSERVATIONS.

In making any filling or attempting any operation or restoration upon the teeth we must first make a careful study of the conditions as they present themselves. Every case that comes to us has some point or points of difference and every case must be studied by itself. We must make a general examination of the whole mouth to determine the susceptibility of the patient, the condition of the fluids of the mouth and the condition of the mucous membrane, for upon these conditions must we depend for a knowledge of how great must be the extension of our cavity for the prevention of recurrence of decay. It will not be necessary, for example, to carry the margins of our cavities quite so far into immune territory in cases that present where there is quite a general immunity and in which the secretions of the mouth are normal and the mucous membranes are in a state of good health,

while in cases of extreme susceptibility it is absolutely necessary to give the widest extension possible.

The occlusion must be carefully studied and any abnormalities observed. Particular attention should be paid to the facets worn upon the occlusal or incisal surfaces of the teeth, as these are sure indications of the direction and stress of masticatory movements. If a filling is made without observing these things the operator is liable to get into trouble by reason of the fact that a power is brought into action upon his filling with which he has not reckoned, and consequently has made no provision to meet, and his filling will fail in consequence.

I once made a filling in the mesioincisal surface of an upper right lateral incisor and was very proud of what I thought was a very beautiful filling, but what was my chagrin to have the patient return in a short time with the incisal portion of my filling ground through and the whole filling loose and a complete failure. I now, tardily, made an examination of the occlusion and found that the sharp point of the right lower cupid in its excursions in mastication trailed over the incisal surface of the upper lateral in such a way that it wore a groove in the incisal surface, which I had not noticed by reason of the decay of the tooth, but, upon its restoration, the former action was immediately brought again into play with the resulting loss of the filling. I remade the filling, ground off the point of the offending cupid and have had no further trouble.

In the same way we sometimes find long, sharp cusps upon bicuspids that fit into deep sulci of the occluding bicuspid. In restoring these it is well to relieve the occlusion by grinding off a portion of the antagonizing bicuspid. Not only must we observe the normal occlusion and the natural excursions of the teeth during mastication, but we must carefully look for signs of abnormal excursions of the teeth during sleep, as in the habit of grinding the teeth at night, or as the result of nervous habit during periods of excitement. Failure to do this may cause embarrassment, as happened in one case of mine. I had made a filling for a lady in the incisal surface of an upper right cupid and had the pleasure of seeing that filling the next day completely ruined by the habit of grinding her teeth at night. It did not seem possible that

she could reach that particular place with any of her lower teeth, but after trying for some time I found that a cusp of one of the lower teeth did fit into it during a specially peculiar motion of the jaw. We fixed that cusp so it would not do the mischief again, and another lesson in studying occlusion was learned. There are some cases, however, that seem to defy all of our precautions in this respect. One case comes to my mind, that of a lady with a highly organized nervous temperament, who presented with the lingual and incisal surfaces of her teeth very badly ground down. She asked for a porcelain restoration, which, of course, would have been the height of folly, for porcelain would not have stood the stress of that tremendous strain for fifteen minutes after she got into action some night. During the daytime and upon our examinations I had never been able to make her close her teeth in such a manner as to reach those fillings, but she presented herself after a time with a groove running mesiodistally clear across those fillings and it was always done at night. In this particular case I built the lingual surfaces and over the incisal surfaces of both central incisors with platinized gold, and although a deep groove has been worn in both fillings they are still doing good service.

Not only must the direction and peculiarities of the occlusion be observed, but the strength thereof must be carefully noted. For if we place a filling in a tooth upon which there is great stress and do not anchor the filling sufficiently; if we do not make the steps broad and deep enough to resist the force that is brought to bear upon it, the filling will fail in time either by being bodily crushed out of the cavity or by having its form so changed by the flow of gold under stress that the filling will leak and we will have a recurrence of decay. This is a phase of failures that frequently puzzles very good operators. They will make a filling and feel sure that they have made a good operation, feeling confident that the adaptation of the gold to the cavity walls has been perfect, and yet after a time the filling comes back with a dark-blue margin and all the evidences of recurrence of decay. In many of these cases the operator will notice that there has been a wearing of the gold upon some portion of its occlusal surface, and that surface not being heavy enough has not only been worn under the stress, but there has been a "flowing" of the entire mass

of gold in the direction of the stress, consequently there has been a slight change in the shape of the filling and a recurrence of decay due to the ingress of moisture. The remedy is to note the direction and strength of the stress of mastication and then at those points that must resist heavy occlusion cut wide and deep that you may have a large mass of gold to resist the stress at that point. Again, we must note in what portion of the tooth our cavity is situated, knowing that greater strain comes upon certain portions of the tooth than others. For instance, we know that the mandible in mastication normally closes inside of the superior maxillary. The lower teeth closing inside of the upper teeth, therefore, the lower jaw exerts a force toward the mesial surfaces of the teeth. The stress therefore comes upon the mesial surfaces of the upper teeth and upon the distal surfaces of the lower teeth. In making our fillings, then, it behooves us to anchor more firmly the filling in the mesial surfaces of the upper teeth and in the distal surfaces of the lower teeth than in the opposite surfaces of the same teeth. We should also note the masticatory habit in the linguobuccal occlusion, for in nearly all cases, by closely observing the facets worn upon the surfaces of the teeth, we will find that each individual commonly exerts more stress in one direction than in the other. That is, he may commonly chew his food with a movement from right to left, or from left to right. In many cases it is important to know which way the greater stress is liable to come, that a buccal or, it may be, a lingual wall may be protected from a stress that may be too great for it to bear. In my practice I find that it is usually the lingual cusps of the right upper and the left lower teeth and the buccal cusps of the left upper and right lower teeth that suffer the most, indicating that the majority of cases that have come under my observation habitually grind their food with from right to left movement. This may be but a coincidence, but it is an interesting one and one that will bear further observation. But in every case involving any considerable portion of the occlusal surfaces of bicuspids and molars it is wise to carefully note this particular form of stress, and then protect any weak cusp that may have to bear the brunt of that stress. Failure to do so will invite the destruction of a cusp, an accident that is peculiarly unfortunate, as

it nearly always means the loss of the crown of the tooth.

Again, it is our duty to note the condition of the pericemental membrane, for upon its condition must depend, in a large degree, our choice of a filling material. We know, or should know, that it requires a considerable force to properly condense gold foil, and if we attempt a large gold restoration in a tooth that is decidedly "lame" as a result of a pyorrhea, or some form of pericemental irritation, or in a tooth that has no occlusion, and as a result has a "soft," tender membrane, we will find before we go very far in the operation that the patient is suffering intensely under the strain of malleting, and if we persist we will probably have a very sore tooth if we have not permanently disabled it. In such teeth a large gold filling is decidedly contraindicated. To the average man all this may sound rather nonsensical, as he will think that all of these observations will take more time than it would take to make a good-sized filling. On the contrary, it will help you make your fillings more quickly and surely more perfectly. At first it will take time, I admit, but by continued practice and observation all of these points will be noted in a glance and far quicker than it takes to tell. Then with the conditions in mind, knowing the corrections that are to be made, there immediately arises in the mind's eye a picture of the desired result, and any man that commences any work, be it the plan of some great cathedral or skyscraper office building, a picture or a statue, my lady's bonnet, or your latest suit of clothes, or, forsooth, an operation upon any particular tooth, and has not in mind a perfect picture of the finished product, is going either to make a failure or is going to spend far too much time in its accomplishment. Then if you have it not, first form the habit, and do it now, of knowing what you are going to do before you do it, know how you are going to do it, and know why. If you do this you see every step of the procedure mapped out before you, you know just the instrument that you need to accomplish each step, and quickly and surely each step succeeds the other until in time that is a surprise to you and a pleasure to your patient, the operation is completed. The reason men are so slow is that they have no definite idea of what they are to do and no idea how they are going to do it. If there is any one thing that I hope to establish

in these articles it is that definite measures produce definite results in definite time.

(To be continued.)

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## METALLIC ANCHORAGE IN CROWN AND BRIDGE WORK.

BY B. J. CIGRAND, M.S., D.D.S., CHICAGO, ILL.

In conformity with a promise made to the editor of the *DENTAL DIGEST*, this contribution relative to employing metal as an aid in anchoring crowns and bridges is submitted to the readers.

Experience has taught us that too frequently the crowns and bridges which we locate do not remain permanent fixtures in the mouth, notwithstanding our painstaking effort to cement them into position; they loosen and the crown or bridge either suffers damage or induces injuries to their supports. The problem before us is not the principles of crown construction nor bridge formation, but entirely the theme of anchorage. We assume that the technique of crowns and their logical assemblage is thoroughly understood, hence that feature does not engage in the present writing. But the proposition of attaching or anchoring the laboratorial product, that, indeed, is the primal topic.

It requires no lengthy word picture to supply the mind's eye with the frequent sight of an eliminated crown, with its metallic post, surrounded at the base with disintegrating cement, while the apex of metal is free from any material of attachment. The same applies to the loosened bridge. What is the difficulty, and what element of philosophy or chemistry have we overlooked, which induces this failure in an otherwise perfectly constructed and well-adapted dental substitute? This item of prosthetic procedure has been overlooked, since our practitioners were eagerly solving the equation of superstructure principles, forgetting or disregarding the important feature, the substructure. As in the field of human industry, the science of bridge building must teach us that foundations are essential. It is not enough to plan and arrange a cantilever bridge or old form abutment bridge, since the superstructure without a truly calculated base and its pillars, in ratio to stress and strain, the entire mechanically constructed structure

will transform itself into a mass of worthlessness. And so with the appliances we hope to position and retain; they, too, deal with the problem of stress and strain, and a complex force, engaging partial rotation coupled with a lever power. Hence our product has more varieties of force to encounter and withstand than the stable, located railroad bridge. Yet from the engineers of the commercial world we can learn much, and in bridge building we, as a profession, can get eminent lessons from the supposed inferior craftsman. Years of observation have taught the real bridge builder that the foundation is primal; that in more than sixty per cent of failures, a weak, unsubstantial pier, abutment and shore anchor was the cause of the desolation of all. And when the bed upon which the bases and pillars rested were solid and unyielding, being anchored firmly into mother earth, the likelihood of damage to the bridge proper was lessened in direct ratio to the increased strength of foundation. May this not be the difficulty in part with our deficiencies in crown and bridge work? Do we not too often expect a bridge to endure upon weak and insufficient pillars? Are we not in huge spans assigning too much weight and wear upon a few roots instead of gathering support in the center by a root which we thoughtlessly extracted, thinking it too badly decayed or unnecessary? That apparent drone root, if properly prepared and accurately adjusted, would, in all probability, save the bridge from an overstrain on the outer or extreme anchorages. While the foregoing argument may be a partial cause for our failures, it is only the lesser fraction of the cause which induces and produces the eventual collapse of the bridge.

Our greatest mistake lies in the cold fact that we rely on cement as a means of anchorage. Our present method of cementing both crowns and bridges is at fault. We will not attain to that position of successful prosthodontists until we recognize our shortcomings in this phase of restorative art. There is not in the market this day a cement which will give the desired result. All these materials of metallic oxychlorids or oxyphosphates are too porous, and when employed other than in mere films are harbors of debris and soon lose the virtue of an adhering substance. Experiments innumerable lead me to conclude that cement in crown and bridge work is serviceable and durable when em-

ployed in a thin or film amount; in mass it does not endure; besides, the fluids of the oral cavity penetrate it and sediments remain in these myriads of pores or minute caverns, inducing a conglomerated mass of putrid vegetable and animal debris. Evidence of this is present in a most emphatic character when we remove a gold shell crown; the odor from the sponge-like cement is pronouncedly disagreeable. This odor is ever escaping from crowns and bridges, especially from telescope gold crowns and in large cement fillings, which we remove to replace with inlay or metal fillings—the same offensive odor is torturing the olfactory nerve. I need not dwell longer on the unsatisfactory results following the use of cement, since the evidence is indisputable. And what applies to cement applies to guttapercha, only in a more exaggerated character. Algebraically writing, we would say that the odor of guttapercha is raised to the highest power. The practice of setting crowns and bridges with the sap of the ismander tree is condemnable, and while many practitioners continue to advocate it there certainly is room for grievances against this temporizing manner of anchoring dental substitutions. Many of our practitioners entertained the idea of setting them with guttapercha, advocating that this material admitted of easy removal of the crown and also acted as a soft, yielding cushion for the porcelain substitute. I am not prepared to accept this method as practical or hygienic. I doubt the practicability of such a procedure; besides, it indicates a temporizing effort. But this is not the main reason for my objection to the use of guttapercha alone; I cannot believe that a crown which is set on a material which acts as a cushion is sufficiently dense to exclude the oral fluids. If it yields, springs and easily changes to accommodate every movement of jaw and force of pressure, it goes without saying that the material is porous and consequently harbors the oral mucus and fluids, and this condition must speedily destroy its efficiency and finally act as a home of debris. Those of us who have had the misfortune or displeasure of removing a crown of this character, set with guttapercha, must remember most vividly the unwelcome aroma contributed to the office, not to mention the discomfort to the patient. This method of setting crowns and bridges with guttapercha has seen better days, and metal of a

virgin character, supported by any of the good cements in film form, will give us the most satisfactory results.

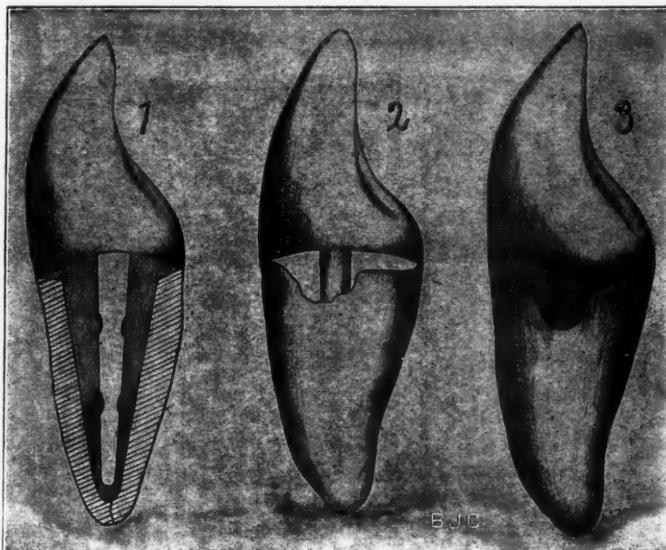
While the method I advocate does not dispense with cement entire, it minimizes its use, hence lessens its objectionable qualities. Under the lenses cement presents the appearance of furnace slack, huge holes, crystallized caverns and avenues, surrounded by deep pockets and communicating pores. When in film form cement is not so porous and gives a better result as a substance for attachment. The mechanical woodworkers will inform you that glue employed in their film form will not only adhere better but last longer. May this not be likewise true of cements? Whether or not my experiments have led me to conclude that the cement problem in crown and bridge work resolves itself into the deduction that the less cement you use the better will be the results, practitioners of this day and generation are still inclined to regard a root useless and worthless because a band cannot be fitted about it, when the root otherwise is in good healthy condition, with sound tooth structure as its asset. The reign of the forceps is still dominant in most offices, and a spirit of dental preservation has not fully taken possession of the profession. The looseness of a root need not necessarily indicate that it could not carry—and creditably—an individual crown. Accord this root normal masticatory exercises and the circulatory system will contribute new life to its adjacent parts, rejuvenating the membrane of attachment. Such a root can be brought back into service when properly assisted. These "drone roots" are often extracted when logic would dictate their retention. Give these roots dental antagonism—give them what nature intended them to have and a happy surprise will come speedily to the practitioner.

The method here described is the result of nine years of practice and it has my heartiest recommendation because of the surprising results obtained in employing metallic anchorage in all cases of crown and bridge work.

This method I have advocated in four papers and three clinics, and the hundreds of dentists who are following the method are meeting with pronounced success in this departure of prosthetic technique and operative principle.

Not infrequently a root is perfect with the exception that

either mesially or distally it may be decayed below the alveolar circumference, and by this method you simply ream out with bur the defective portion and allow the wax to dip down at this point, and when the crown is set you have the metal restoration both in the canal and partial circumference. (Figs. 2 and 3.) This is so definite and easy a method that none should extract a root thus affected. Many such roots have been pronounced "unworthy" and extraction has been the climax; or when the

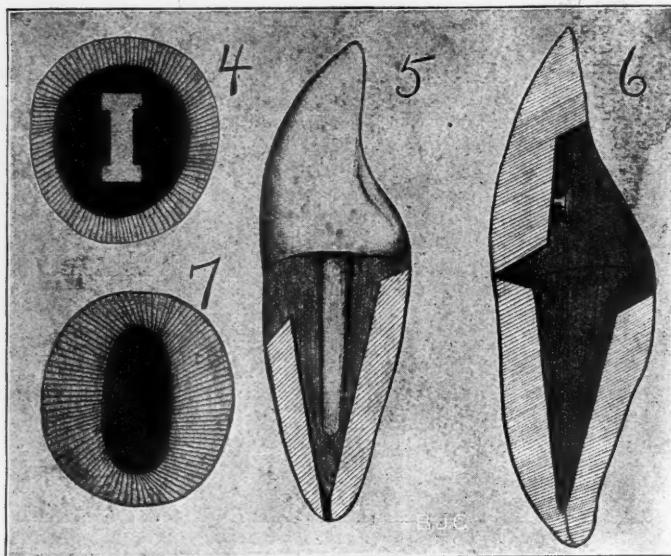


root was allowed to remain the method of attachment was cement, and the result was that the small post of the crown, with its insufficient surface for cement anchorage, soon loosened and the cement once fractured soon lost its hold on the metal, and the crown or bridge which was attached, regardless of its mechanical perfections, was cast aside as a failure.

Now we have depended entirely too much on the cement and have lost sight of the principle of "positive resistance," which can best be attained through the medium of a congenial and tolerant metal, which must be so shaped as to come in direct

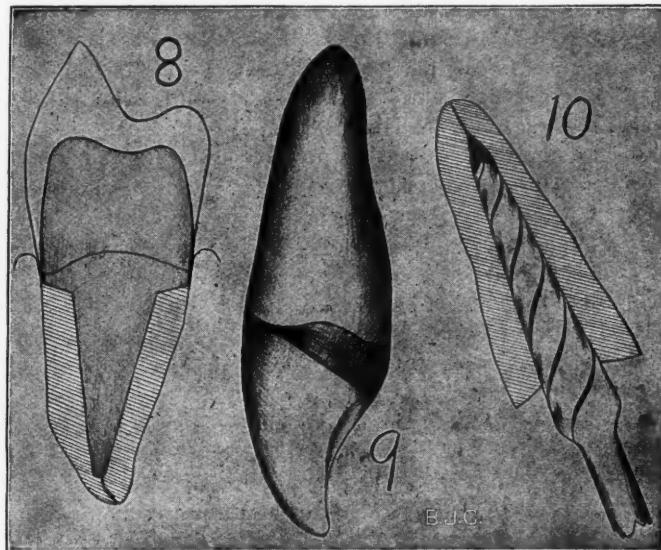
contact and be in immediate apposition with the tooth structure, admitting to the cement or any indissolvable solidifying fluid or paste the function of uniting the metal to the tooth structure, causing an hermetical joint. When this is done you have performed the operation of definitely locating the crown or bridge. If I have convinced you of this prosthetic principle, be assured that the method I advocate will be easily understood and its procedures readily comprehended.

After you have trimmed the ragged circumferences of these



characters of badly decayed roots, ream out the decayed or broken-down structure, adapt your crown in the usual manner, and, after you have arranged for normal or convenient articulation and occlusion, remove the crown or bridge and adapt wax to the post to approximately conform to the enlarged root canal opening. The wax will possibly be in excess of requirement, but heat same over the alcohol flame, varnishing canal with any disinfectant oil, reinsert the wax-covered post and repeat until absolute fit is obtained. You then proceed to invest the crown in

your casting apparatus, and after freeing your investment of its wax pattern, and drying the mold, you introduce into the form the molten gold or acolite. (Fig. 1.) While gold in this instance of restoration might seem imperative, I must confess that acolite, a new alloy, compounded by Dr. T. G. Vernon, has superior physical qualities and desirable requisites, and answers the purpose with satisfaction. It resists the oral fluids and is congenial to the



tissues, giving good results when cast onto porcelain because of its non-shrinkable qualities.

It might not be amiss to add that the form you give to the root canal will have decided effects upon the likelihood of the rotation of the crown when set. An absolutely round or circular opening is not advocated; an oval or rhomboidal opening will give best results.

In using the Ottolengui canal reamers it is a mistake to employ a large one. (Fig. 10.) Choose a small reamer, and by giving it an anteroposterior movement you are enabled to enlarge the canal in an elliptical form, and thus leave the root

structure thick at its lateral sides, where the major strain falls and where the root must of necessity be the strongest. Further, this rhomboidal opening allows the encased post to tightly hug the walls of the root canal and thus affords additional anchorage to the crown. (Figs. 4 and 5.)

The Davis, Brewster and Justi crowns are in many respects an improvement over the Logan, inasmuch as the pin is smaller and more rigid, admitting of crowning small-rooted laterals and insuring permanent lodgment. I have obtained the best results from the Brewster crown by fitting the post tightly and just before setting taking the crimping pliers and producing a wave in the metal post. This causes the crown to adhere tenaciously without contributing a strain to the material of attachment.

You may think me extreme when I say that every crown we set will serve its purpose immeasurably better if the post is encased in a metal which perfectly fits the root canal, hence this method can become an established procedure in the setting of all crowns and bridges, though its limitations are far from being circumscribed by crown and bridge work. It can be most effectively employed as a means of restoring badly decayed molars and bicuspids and contributing to them practically their original strength and purpose.

An instance of where it can be conjointly used as both operative and prosthetic occurs in roots where the anterior half has chipped off or partially broken away the anterior circumference; and these cases are plentiful, besides they are of a character that would tax the ingenuity of the most patient operator. By the method I advocate, you simply force away the gum tissue with either cotton or guttapercha, dismiss the patient with appointment for following day; remove the packing and adapt wax to restore the lost tooth structure and when fitting post of crown, join the bodies of wax, making one mass of same; carefully remove entirely, cast as recommended, and when you adapt this crown to place (Fig. 5) you will have convinced yourself that a difficult task has been accomplished in an easy manner.

To those who prefer to use a porcelain facing and construct from it an individual crown the process is similar to the preceding, with the only difference that you add wax on the lingual sur-

face to conform to the bulge of the tooth then cast, and you have quickly and with little labor reproduced the missing dental organ. (Fig. 6.)

My experience with the Logan crown has led me to discard it because of its soft, pliable and yielding platinum post.

Often when these crowns are set on a small lateral root the circumference of the root will not allow a thick, heavy post. The result is the force of mastication bends the post and tips the crown forward, and makes it look about as coherent as the leaning tower of Pisa, and like this historic tower can be advertised to the world ~~as~~ standing so by either accident or design. But by enveloping this soft post with a metallic film or veneer you have completely overcome this weakness.

Sometimes it is desirable to build up the second bicuspid root to receive a gold crown and the old method is a failure. The all-gold shell, when telescoped over a large amalgam filling, often results in failure because of the action of the mercury in the filling, and when this filling is anchored by screws other than gold or platinum it will invariably result in failure, notwithstanding that the gold crown is constructed without a fault. The anchorage has been insufficient.

The base-metal screw oxidizes, thereby losing its hold on the root and comes away after but a short time of service. By packing the canal with wax, building this up to requirements and casting so as to complete metallic body for gold crown adjustment the anchorage is permanent. (Figs. 8 and 9.)

The method I bring for your consideration is not evolved to lessen our burdens as practitioners, though it does most pronouncedly simplify our task—but I advocate it because of its preservative and preventive dental principles.

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### NOSTRUMLNS IN DENTISTRY.

BY ROBERT WAKEFIELD, D.D.S., CRANFORD, N. J.

A great deal has been written recently regarding the use of drugs and remedies, the exact composition of which is unknown to the user. It might be asked why we, as a profession, fall such easy victims to the lure of proprietary preparations. Is it because they contain some mystic drugs unknown to everyone but

the manufacturer? Is it due to our lack of knowledge of *materia medica* and the various drugs at our disposal? Or is it due to our inability to apply our knowledge, combined with laziness?

Let us consider for a moment the subject of local anesthesia. Gaze for a moment in the advertising pages of our dental magazines and you will find an endless list with a variety of names. All of these doubtless contain cocaine hydrochlorid as the base. Let us consider for a moment the wonderful (?) properties which a preparation of this kind should possess. 1st.—*Anesthetic*.—Cocaine answers this purpose as well if not better than any other drug in use at present, and when combined with a stimulant, e. g., strychnin sulphate, no depressing effects will be noted. *Antiseptic*.—Boric acid will answer nicely for this purpose. A little phenol, one-half of one per cent, will render fungus growth impossible. As a vehicle we would suggest distilled water.

Worked out the prescription reads as follows:

R Cocainæ hydrochloridi,	gr. ix
Acidi boraci,	gr. xx
Strychninæ sulphatis,	gr. 1-5
Phenolis (95%),	m. iv
Aquaæ destillataæ,	q. s. ad f 5ij—M.

Sig.—Use as a local anesthetic.

In the preparation of solutions for injecting, too much care cannot be exercised. It would be better if the dentist were his own pharmacist, in this case, at any rate. All the necessary apparatus should be in every office and comprise a pair of scales, graduate, glass funnel and filters. The solution, after being compounded, should be thoroughly filtered.

Another unknown that has found favor in our ranks is the combination root filling and abscess cure. These are various and many. All presumably will cure abscesses and make reliable root fillings. But why should we use these unknown combinations when we know the qualities such a preparation should possess, namely—ease of introduction, germicidal, mummifying and freedom from absorption? The consistency compatible with ease of introduction should be fluid or semi-fluid. It should be strongly antiseptic, and harden after insertion. It should possess the property of mummifying any minute portions of the pulp that re-

main after extirpation. The following formula possesses these qualities in a marked degree:

Liquid.

B	Creosoti,	f 5iii
	Formalini,	f 5ss
	Alcoholis,	f 5ii—M

Sig.—Use as liquid.

Powder.

B	Zinci oxidi,	5viii
	Thymol,	
	Alumini et potassi sulphatis,	a a 5j—M

Sig.—Use as powder.

These should be mixed to a creamy consistency and teased into the canal with a smooth broach. Remember, however, that this material is irritating if forced into the apical space. It is far preferable to leave a little space between the root filling and the apex than to force even a small amount through. It is desirable in large canals to use, in conjunction with the above, a gutta-percha or lead cone.

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### THE IMPORTANCE OF EXTIRPATING THE PULPS OF TEETH WHICH ARE ASSOCIATED WITH PYORRHETIC CONDITIONS OF THE SOCKETS.

BY G. LENOX CURTIS, M.D., NEW YORK CITY. READ BEFORE THE VER-  
MONT STATE DENTAL SOCIETY, AT MONT-  
PELIER, MAY, 1908.

My subject with all its ramifications is so broad and deep that it is impossible to cover the ground in so short a time as is prudent to attempt on an occasion like this, therefore I shall only mention some of the more salient points, leaving some of the others to be brought out in the discussion.

Seldom do I see a case of pyorrhea alveolaris the development of which has not been assisted by the dentist having it in charge. By this statement I mean that nearly every case of this affection is either neglected or improperly treated, thereby allowing the

disease to become fully established. This unclothed assertion is made for the purpose of waking up the profession to a proper sense of responsibility by placing the blame where it belongs, so that the coming dentist will be prepared to add proper preventive means to his methods of practice. Should there be any persons present who feel that in declaring that pyorrhea alveolaris can be prevented I have overstepped the bounds of truth—that such a statement cannot be supported by facts—they should spend at least a week examining the mouths of the patients of such practitioners as Dr. D. D. Smith of Philadelphia and Dr. E. C. Taylor of Hartford. They will then realize how impossible it is for this demoralizing and disastrous disease to become established when mouths are treated with *proper prophylactic precaution*. If further proof is needed let them take the motto of the three "P's" home; frame it, hang it conspicuously in front of their operating chairs, conscientiously comply with its requirements in every case treated and carefully note the results of such practice for a year or two. I am sure the outcome of this experiment would be sufficiently convincing to remove from their minds any lingering doubt about the possibility of preventing and curing this "bete-noir" of the dental profession.

Barring accidents, I firmly believe that, owing to faulty and unscientific methods of treatment employed, physicians are responsible for at least 50 per cent of the deaths that occur in their practice. Can dentists show a less percentage in their cases under treatment?

My sole object in writing a paper is to set forth new truths or to describe improved methods of practice; some parts of it, on account of the pointed and fearless criticism it contains, may, like an unpalatable but wholesome medicine, leave a bad taste in the mouths of those to whom the criticism applies, but if they are neither cowards nor impostors, all impersonal reference to their shortcomings will only make them the more eager to incorporate the new facts and suggestions presented into their daily practice. This is only the fourth paper on the subject of "Pyorrhea Alveolaris" I have written in nearly thirty years of practice. Some dentists I know put out a paper nearly every year and talk on the subject at almost every dental meeting they attend, and yet

they contend that this disease is incurable. I ask them, who is responsible for its existence—the dentist, who, ignoring proper prophylactic precautions, declares it is incurable, or the patient who is so unfortunate as to select such a dentist to care for the health of his mouth?

A prolific writer and talker on this subject, one who, I am sorry to say, seldom has any but ill words for other practitioners, told me three years ago that he had not treated a case of pyorrhea alveolaris in four years; that his under-graduated or recently graduated assistants, whom he said were *experts*, treated all his cases. I was appalled at this statement, and replied, "If this is the case, you had better stop writing and talking on this subject." One of his assistants since then told me that many of the mouths which this dentist had pronounced cured were reeking with pyorrhætic infection. Those who know this man best speak of him as a "huge joke," but those who are less fortunate regard him with awe, and, year after year, continue to search his writings in vain for an original thought.

All this prelude is for the purpose of attracting your attention and so agitating your minds that what I shall have to say will make a lasting impression.

I desire at this time to discuss with you a very important principle of practice which I did not emphasize in my former papers. (See *New York Medical Journal*, January, 1899; *Dental Cosmos*, June, 1894; *International Practitioner*, June, 1898.)

About twenty years ago I fully realized the importance of extirpating the pulps of teeth whose sockets were surrounded with pyorrhætic conditions, cleansing and filling their canals to the apex and amputating that portion of the root which could not be so treated.

At that time I observed that as long as the pulps of affected teeth possessed vitality, inflammation in the surrounding tissue was bound to occur and that it would not subside until the pulps were removed. At that time, however, I did not have the courage of my convictions and only removed the pulps of teeth whose roots were almost completely denuded. Seeing the healthy condition that uniformly followed in that portion of the jaw in which extirpation of the pulps had been made, I gradually extended the

practice until in 1896 I began extirpating the pulps of all teeth whose roots were involved in any pyorrhetic invasion. The result of this method of procedure, in conjunction with constitutional treatment, was so satisfactory that I was able to state in my first paper relating to the subject, that pyorrhea alveolaris can be cured. I very well recall some of the bitter attacks that were made upon me for making and defending such a statement—a statement which was directly contrary to the teaching of men who had no practical knowledge of my method, and who did not even treat the disease, but who, nevertheless, were continually talking and writing about it. None was more rabid in his denunciation than the dentist previously referred to, but I noticed that a few years later he wrote an original (?) paper on the subject, in which he not only advocated the removal of the pulps of all teeth involved, but also of the pulps of all teeth of adults afflicted with this disease, in order to anticipate and prevent the possibility of future invasion. So you see I made an impression upon at least one practitioner. I learned from experience the value of my method and continued to practice it, regardless of the adverse criticism of those who really did not have enough knowledge of the subject to justify the expression of an opinion. This class of critics reminds me of a bright child I knew, who, when heard jabbering to himself, was asked what he was trying to explain, replied, "Oh, that's just talk."

You may ask why the pulps of pyorrhetic teeth induce inflammation of the sockets and tissues surrounding them. These results occur because, under existing conditions, the pericemental membrane does not supply these parts with sufficient nourishment. The pulp is thus deprived of nutritive supplies sufficient to maintain the happy balance of the different forces that sustain the tooth, and it becomes impoverished in vital energy and unable to perform its normal functions. It is in a condition similar to that of an electric bell when the battery is exhausted or the current is grounded and run off into improper lines. I regard the normal tooth as a healthy organism, sustained in health by electrical as well as by blood conditions, and whenever this happy balance between the two becomes disturbed, a tendency to disease results.

There seem to be predisposing causes (such as the degener-

ating influence of syphilis) which aggravate and perpetuate the destructive process to such an extent that special treatment for the removal of these complications is necessary before a healthy condition of the parts can be established. It is well understood that moisture is necessary to maintain nervous action and that nerve force is to promote the flow of blood in the arteries and veins. Every blood vessel is accompanied with a sufficient number of nerves to provide it with the amount of nervous energy necessary to convey the blood to all points where it is needed to maintain the nutrition and life of the tissues which the vessel, with its numerous ramifications, penetrates. These microscopic nerves probably support the nervous currents which cause the blood to pass through the zone between the capillaries of the arteries and the veins. To injure one of these nerves is to impair the flow of blood in the vessel and thereby cause a corresponding impoverishment of the tissues which this vessel supplies with nutritive material. To reiterate, both nerves and blood vessels are necessary for the functional existence of any part.

Anything that interferes with the free passage of nerve force or blood supply either interrupts or short-circuits the nerve current necessary to maintain complete nutrition, and invites destructive tendencies, which, if not prevented or completely eradicated, produce degeneracy and death; therefore, the function of the pericemental membrane is to supply nourishment to the pulp and tooth as well as to cushion the tooth. The membrane receives its nourishment from the alveolar tissue, which, in turn, largely supports the cementum. If it becomes impaired by congestion, separated from the roots by calcific deposit or bacteria the membrane must necessarily degenerate and become destroyed and, if not quickly checked, it soon involves the entire tooth.

I have been informed that the microscope has demonstrated that the dentinal fibers pass directly through both the dentin and cementum, ending in the pericemental membrane; a belief I have for a long time entertained. This being the case it is evident that the pulp and pericemental membrane are intimately associated and dependent each upon the other for their nutritive support.

If it were possible to make a section of the dentin and cementum in line with the dentinal fibers, I believe it would show a

perfect anastomosis of both blood vessels and nerves between the pulp and the pericemental membrane.

You can understand by this how it is that when the membrane is separated from the root, the nerve current is continued, but in an interrupted and erratic manner.

From the fact that electricity, sufficient to light a lamp, can be sent from its source to a considerable distance through the air, why cannot the interrupted nerve energy pass from the pulp through the cementum and irritate and inflame the pericemental membrane?

I am ready to accept the theory that the body is supplied with an independent system of nerves called *reparative*, whose only function is to rebuild tissues injured or destroyed by disease. The failure of a diseased organ to recover is evidently due to a lack of this reparative energy, with which it is normally supplied; therefore, the remedy must be something that will reestablish the normal flow of nervous energy to the disused part. This may be accomplished by drugs, or, preferably, by high-frequency currents or direct manipulation of the nerve center.

Where I have used the high-frequency current and ozone, the restoration of the function of these nerves has been phenomenal, the disease quickly disappearing, because not only are the nerve centers recharged, but the underlying and degenerating cause is oxidized and eliminated, while the remaining tissue cells are revivified.

To merely remove the putrescent condition and calcareous deposits surrounding the tooth is not sufficient to effect a cure; therefore, to secure this result, systemic treatment as above outlined must be employed.

There are few, if any, subjects, no matter how trifling they appear on the surface, which, to thoroughly investigate, do not require much time, energy and reasoning in order to ascertain the underlying principles which maintain them.

To the scientist, investigation is a pleasure and not work. It is life-giving because of the knowledge gained, and few can appreciate the satisfaction he realizes from his researches. He is a layer of the foundation of knowledge, which distinction is his to the end of time. He who takes the time necessary to thoroughly

comprehend a subject is usually rewarded for his efforts. Most of us are content to accept conditions without looking for the cause. The satisfaction lies in investigating the creative course and in understanding life production and life destruction.

**SANITATION.**—Snow considers the methods of bringing about a thorough awakening in reference to sanitation. He insists that what Great Britain has acquired through the expensive but effectual teaching of terrible visitations of epidemic disease, such as cholera and typhus, is what America most needs—trained, full-time medical officers of health and security of tenure in office. The requirements to attain these ends are: First, the active support of a public, educated in personal hygiene and general sanitation; second, the enactment of adequate legislation covering the duties and powers of our public health departments; third, proper facilities in our universities or medical schools for training expert assistants in vital statistics, epidemiology, public health, laboratory technic, etc., whom we may appoint to carry out the details of direct investigations on which all our executive actions should be based, if we are to deal effectively and fairly with the varied problems arising from day to day. He concludes by urging the association to work for: First, paid secretaries for the county health officers: second, the establishment of a bureau of sanitary survey and epidemiology of the state board of health; third, better co-ordination in public health education work.—*Jour. Amer. Med. Assn.*

**A DISAPPEARING ROOT-FILLING.**—To fill the root-canals of deciduous teeth which the osteoclasts are about to absorb to make room for the growing permanent tooth we must have a material that will be absorbed with them and will adhere to moist surfaces, as we cannot thoroughly dry them; a product which is non-irritating and, if non-medicinal, a conveyor of drugs. For this purpose the writer wishes to suggest a treatment of formalin and tricresol, equal parts, as recommended by Dr. J. P. Buckley, for sterilization, which is to be removed in forty-eight hours. After the removal of carious matter the root-canals are filled with this formula:

B—Isinglass .....	5j
Tannic acid .....	gr. jss
Tricresol .....	m. iv
Aqua dest. .....	f3jss

This mixture when heated to a temperature of 100° in an ordinary glue-pot or water bath becomes sirupy and can be readily introduced into the root-canals with a piece of sterile catgut. If the canal be large the catgut may be left in the canal. A ball of stiff zinc phosphate is then pressed into the pulp chamber, forcing the mixture through the canal and sinus. The cavity is then filled and contoured with amalgam.—H. C. FERRIS, *Items of Interest*.

### Digests.

THE DISTINCTIVE FEATURES OF MASTICATING DENTURES AS DEMONSTRATED BY COMPARATIVE OCCLUSION. By Dr. Axel Lundstrom, Goteborg, Sweden. In papers on orthodontia allusions are frequently made to the importance of studying comparative anatomy. It is argued that it is impossible to understand the anatomy of the human denture properly unless compared with other dentures. But I have never found any specific reason for this stated. The treatises on comparative dental anatomy that I have seen have principally contained descriptions of the teeth of different classes, orders, etc., of animals. For example, we are told in one text-book that is, I believe, extensively used in the dental colleges of the United States, that "The Iguanodon had remarkable teeth. Some were flat and spread out like a fan with serrated edges—the base constructed of folded laminae of dentin and cementum, similar to the teeth of the Labyrinthodont." Such facts are no doubt very interesting, and it may be handy on some occasions to have a book containing them, but they have no direct bearing on orthodontia. But yet I am convinced that comparative anatomy has one or two points to teach us, but they are so simple that they do not require any extensive study, and once observed they are never forgotten.

The modern orthodontist of the best training will, with his acquaintance with the normal denture of man and his skill in bringing about this condition in cases presented for treatment, never have any need of comparative anatomy to convince him of the reasons for operating for the best result. But there are many other people concerned with the treatment of malocclusion, so we ought to be able to produce every possible argument in favor of our work. And it seems to me that if we can find that certain characters of the human denture are a rule also with animals in need of mastication, we can conclude that our operations must result in these characters, if it be granted that effective mastication is necessary for the health of man.

The human denture and face are so radically different from those of all other animals, even the most similar, that from an artistic point of view orthodontia has nothing to learn from the

study of comparative anatomy. The appearance of different animal dentures seems to me to be something that the orthodontist has no need to be acquainted with, as he never will be required to fashion the human denture and face after an animal one. But some functions of the teeth are the same, so we expect to find a certain correlation in the human and animal dentures.

It is well known that during evolution the organs of an animal are accommodated according to its wants, in such manner that if useful variations occur in a sufficient number of individuals, they have a chance of becoming fixed and in time become a specific character. It may be of interest to follow this line of evolution, as far as it concerns the teeth.

From what has been investigated concerning the ancestors of the living mammals it appears that they were less specialized, if it be permitted to use such an expression. They were probably in a better position to accommodate themselves and to thrive in a greater variety of conditions than their better equipped descendants, although they would have been easily beaten in these descendants' special field. This lessened ability to become accommodated can be shown by several examples from the animal world, where certain species, having evolved some organ to perfection, yet have sooner become exterminated than their lower relations, as soon as the advantages of this excessive specialization had disappeared.

If we now examine the evolution of the masticating apparatus of mammals we will find that in the denture of those animals to whom mastication is of importance certain sections of the dental arches have become specially modified for this purpose at the expense of others which have remained unaltered, becoming more or less rudimentary, or even disappearing. The original denture gets divided into one part that is used and another that is not used. Between these two sections we may note the following differences: When teeth are present in the unused portion of the arch, they become subject to several changes during the evolution of the species in question, of which the most important are that they do not reach to occlusion, and they become smaller and get separated approximally. The teeth in the used portion, on the contrary, retain occlusion and have approximal contact. The

farther the division of labor has advanced, the more apparent is the difference. The denture of the carnivora is very instructive in this respect. The felidae are perhaps the most purely carnivorous of them all. Of their remaining fourteen premolars only eight seem to be of any use. These eight are well developed and have occlusal and approximal contact, which the ones anterior to them are without. The dog family has on each side of the upper jaw four premolars and two molars and in the lower four premolars and three molars. Of these thirteen teeth not fewer than seven are too short to strike those in the opposite jaw. There are also spaces between them, while the *dens sectorius* and the remaining molars have approximal contact.

The ruminants and many other plant-eating animals have advanced far beyond this. Their masticating teeth are in close contact, which is not a point, but a considerable surface. On each side of the jaw they constitute a continuous masticating surface, divided from the anterior teeth by a wide space. We stated that the original denture in animals requiring thorough mastication could be divided into a used and an unused section. With ruminants the former has attained a high degree of perfection and the teeth of the latter have disappeared.

We find the same conditions in the dentures of other ungulates, rodents, etc., viz., no spaces between those teeth that are used for mastication, which character is widely prevailing in different families of mammals.

These groups of mammals, who within their class must be considered as highly organized, have also their dentures well suited for that special mode of comminution of the food that is of most use to its owners. In the portion of the denture that is most used the teeth have greater width buccolingually and approximal contact. We draw the conclusion from this, that for effective mastication those two characters are imperative. There are, however, several groups of mammals that have the dentures so defective in just these respects that we must subject them to a more thorough investigation to examine if their anatomy does not contradict our conclusion.

Among those mammals whose dentures are without the characters we stated as necessary for mastication we may first note the

toothed whales. They have often a large number of teeth, but these are small and simple in form and are quite unsuitable for mastication. The bruta also have often a very defective denture, and some are quite without teeth. The sloths have cylindrical teeth with approximal spaces between them all. It would probably be difficult to decide if the food of these animals, poorly equipped with teeth, is more digestible than that of those we first discussed. In many cases the difference seems to be insignificant. The grampus has teeth that are quite unsuitable for mastication, but preys on the same animals as the polar bear, which has a far more efficient denture. The toothless ant-eaters and pangolins live on insects, which the insectivora also do, and the sloths browse leaves like many ruminants.

And that it is not by chance that so many genera of animals have far more perfect organs of mastication than others is easily seen from the fact that the development of the salivary glands corresponds with this, so it becomes necessary to take into consideration their existence and sizes. We will then note that in proportion to the functions of the mouth being decreased, so are these glands diminished in size. The piscivorous whales, who bolt their food like fishes, are without both parotis and sublingualis. But the plant-eating sirenia, who have masticating teeth, have also a large parotis. The carnivorous dasyurus has a small parotis and a large sublingualis, while the herbivorous phalangista vulpina has a larger parotis than its insect and flesh-eating relations.

If we study the higher forms we will find further examples of the relative preponderance of parotis in animals requiring thorough mastication, *i. e.*, vegetable feeders, while the submaxillary glands are larger in carnivora. Parotis is large in the horse, hog, all ruminants, but small in carnivora, and it is very small and even in some cases missing in the seals. The submaxillaries are best developed in those which need the saliva rather as a lubricant to facilitate the passage of the food through the pharynx than as a fluid for its insalivation.

We stated that a large number of mammals were characterized by dentures quite unsuitable for mastication; if, as we have assumed, for this is required broad occlusal surfaces and approxi-

mal contact. And, thanks to caries unhampered by any dental treatment or substituted only by work unsuitably designed, we find a very large percentage of people with dentures, that in point of efficiency remind us of those belonging to these animals, as, for example, those of the edentata, in which we find different gradations of poor masticating machinery down to the toothless ant-eaters and pangolins.

No doubt these dental conditions correspond to the need of their owners, and it may be asked if the defective dentures of many people are not, also, sufficient. The likeness between a defective denture in man and the denture of one of these edentata proves that neither can masticate properly. But there is a great difference between them in the other digestive organs. Concerning this Owen says: "The leading character of the stomach in bruta is one tending to compensate for the poor masticating machinery of the mouth, indicated by Cuvier's name of the order. It is, of course, least conspicuous in the toothed families; but even in these the musculotendinous structures at the pyloric portion, and the thick epithelium continued over the inner surface of that part in phyllophagous species, significantly indicates a community of type under the mask of the most complex modifications of the digestive cavity. The great expanse and subdivision by broad and permanent folds of the cardiac cavity stimulates the ruminant stomach."

We may cite some examples. The ant-eaters have the pyloric portion of the stomach so excessively thick and muscular that it can be compared with the muscular stomach of a bird. The pangolins, who also are toothless, have the stomach "divided in a thin cardiac sac with thin walls, and a thick pyloric portion. It always contains a number of stones." The Cape ant-eater, *orycteropus*, has teeth, it is true, but their number generally gets reduced to nine on each side and has the stomach divided in a right and a left portion, the former of which has very thick and muscular walls. The sloth has approximal spaces between all the teeth. Its stomach is singularly complicated. It is of enormous size and divided into four compartments, somewhat analogous to the four stomachs of the ruminants.

We have yet one group of non-masticating animals to whose digestive apparatus we will give attention. It is that of the whales.

"The stomach is complex, divided into several cavities, in all true cetacea. In the porpoise, the first cavity is continued in the same line with the esophagus, having the same structure and not being divided from it by any sensible constriction; its commencement is indicated by the orifice leading into the second stomach, beyond which orifice is continued in the form of a diluted ovate cavity. It is lined with a cuticle, or thick laminated epithelium, and its inner surface is beset with small rugæ. A number of large irregular projections surround the aperture leading to the second cavity, and are calculated to prevent the passage therein of any substances save such as are of very small size. Notwithstanding the nature of the lining membrane the digestive processes are considerably advanced in the first cavity, which does not act simply as a reservoir. The thick epithelial lining terminates abruptly at the small orifice leading into the second stomach. The interior of this cavity presents a series of close-set, longitudinal, wavy rugæ, laterally indented into one another. The internal layer is thick and mainly consists of unusually long gastric tubes perpendicular to the two membranes which inclose them. The membrane next the cavity of the stomach is smooth; the one external to the fibers is a vascular and cellular tunic, and is invested by the layer of muscular fibers, continued from the preceding cavity. The third compartment is a small, round, vascular cavity; it is lined with a smooth and simple villous tunic. The fourth cavity is long and narrow, and passes in a serpentine course almost like an intestine."

While comparing the digestive conditions of these animals with those of human beings with defective dentures it will not evade our attention that although the masticating capability of both is insignificant, yet the animals have compensation in other parts of the digestive apparatus which man has not. So that if other conditions are the same, people with these defective dentures are at a greater disadvantage than these animals as regards digestion.

It would be outside the province of this paper to attempt to discuss whether at this period of evolution it is so necessary for man to have a masticating apparatus of the strength and efficiency of a normally developed human denture. From what has been investigated in this matter (v. Oefelete), it seems that thorough mastication is a very beneficent factor in the process of digestion.

And it is far safer to give all organs of the body a chance of the use for which we, lacking a better expression, say they were intended. So, granted that what I have tried to show in the foregoing, namely, that occlusal and approximal contact are necessary for effective mastication, and if our present knowledge does not justify us in assuming that this is an unnecessary function, it follows that our operations and orders for operations in the specific masticating portions of the human denture must result in approximal and occlusal contact. We are strengthened in this assumption by the fact that in those animals where the approximal contact was missing, there was ample compensation in other parts of the digestive apparatus.

By quite different modes of reasoning modern orthodontia has arrived at the same conclusions regarding the best possible conditions of the human denture. During earlier periods, while all orthodontic work was connected with the practice of dentistry, certain methods were common, which resulted in more or less the opposite to what seems an efficient denture. We have probably all seen the disastrous effects of the so-called symmetrical extraction, and extraction "for providing space" in crowded arches is still frequently resorted to.

In the foregoing I have tried to show what I believe to be the most important that comparative anatomy can teach the orthodontist. And in spite of the interesting facts that it will reveal to the student, if examined in its various details, I must confess that I consider it a waste of time to go far into these details. The instruction in this branch of science ought, in my opinion, to be limited to the points that I have spoken of in the foregoing. With the help of a collection of jaws it ought to be shown how the dentures have from simpler forms become more and more complex, and that in those parts which are used for mastication approximal and occlusal contact is the rule. Also that where these characters are wanting the animals have as compensation a more complicated digestive apparatus. Of course, the enthusiast will find many other interesting facts, but I believe the outlines I have here briefly sketched are by far the most important and give the most useful returns to the student of orthodontia.

I must admit that I have never attended any lectures on com-

parative dental anatomy specially worked out for orthodontists, nor have I heard of how such courses are conducted, but from discussions on these matters, both with orthodontists and dentists, I have found the prevailing opinion to be that we ought to know something about the teeth of animals, but there seemed to be rather vague ideas as to what this knowledge ought to contain.—*American Orthodontist.*

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THE PREVENTION OF DISEASE OF THE MOUTH AND TEETH BY ORAL PROPHYLAXIS IN THE YOUNG.  
By Dr. Herbert L. Wheeler, New York City. It seems evident, if the forces of evolution are considered, that the teeth and other tissues of the mouth develop along the lines of serving the function demanded of them. Their degree of efficiency is affected largely by the ability of the vital power of each individual to meet the demands made upon it in order to produce the most perfect organs for accomplishing the work in the human economy that these organs are supposed to do. If any particular part of the whole, as, for instance, the alveolar process, the mucous membrane, the enamel, dentin, or soft tissues of the teeth, has been unable to obtain the nourishment necessary to produce the special cells or tissues needed for its development, growth, or maintenance, there results imperfect or retarded development and greater or less imperfection in the formation of these tissues.

Taking this general statement as a description of the situation in the tissues of the oral cavity, it must necessarily follow that the cause, whatever it may be, of the inability of any particular tissue of the body to obtain the necessary pabulum to carry on normal and healthy formation and growth, is to be sought either in the lack of proper food to furnish the normal nourishment, or in imperfection or maladministration on the part of the cells whose duty and function it is to transform the raw or digested food into a usable and nourishing pabulum. The intimate attachment and relationship of the teeth as living organs to the surrounding tissues, and to the system generally, seem never to have been fully understood by dentists. This situation probably plays a major part in producing the lamentable condition on our part of having been unable in the past to do much more than

insert mechanical plugs and extract teeth. And before this condition can be remedied to any extent, there will have to be much more teaching of biology and chemistry in the dental schools than there is at present. The density of the structure of the bony part of the tooth and its small vascular supply, with its corresponding lack of power to respond to stimulation in various ways as the soft tissues do, is probably largely responsible for the persistence with which we stick to the educational methods that produce mechanics rather than professional men.

It is because of the physical characteristics of the teeth that they are too often treated as though they were inert and lifeless organs entirely disconnected from the general system.

No greater mistake could be made. Until dentists begin to appreciate that more of value may be done in preserving the teeth and surrounding parts by the intelligent instruction of the patient in the hygiene of the oral cavity and the judicious use of proper remedies than in our entire system of complicated mechanical repair that now occupies the attention of dentists, there is not much hope for improved conditions.

In order to enable us to properly instruct our patients in the proper care of the mouth and teeth, we must have a general idea of what conditions have produced the efficient mechanism of the teeth as organs of mastication. It is now generally accepted that all the organs of any living animal have evolved from the simple to the more complex form, this change having taken place in response to increased demands, to more complicated demands upon such organs brought about by changes in the environment of the animal. Under these circumstances, it becomes necessary to know something of what the demands made upon the teeth of man have been. It will be possible to gain some idea of this when we remember that when left to her own devices nature works with ruthless hand, making many mistakes, but in a general way eliminating all but the fittest, so that the victory in the struggle is invariably to the strong.

Now, I suppose that the type of teeth in the human mouth, their relation to each other, their relative position and the composition of the surrounding parts and their relation to them, are examples, if you please, of the survival of the fittest. That is

to say, the particular structure and arrangement of these parts that makes for the greatest efficiency in performing the function which is their particular contribution to the maintenance of the whole organism has enabled those who have inherited these serviceable qualities to more readily preserve their existence, while those who have not succeeded in developing such a degree of efficiency have fallen behind in the race, and they or their descendants have been gradually destroyed in the struggle for existence.

The modern tendency to consideration for and assistance of the weak has resulted in preserving the lives of a much larger proportion of mankind up to maturity than was formerly the case in more primitive times. This situation to some extent calls for human intelligence to devise some way to assist nature in her struggle to develop efficiency in the weak. In dentistry this assistance to nature has taken the form of mechanical repairs after the destruction due to degenerate or decadent tendencies has well begun.

In the matter of the correction of irregularities of the teeth some advance over previous methods has of late been attempted, and it would seem that the prevention of destructive diseases of the organs of the oral cavity must be the ultimate goal of the practice of dentistry, unless it shall degenerate into a trade. In order to accomplish this, it will be necessary to begin with the mouth of a child as soon as the deciduous teeth begin to erupt, and to continue our exertions in this matter in most cases throughout life. My suggestions as to the best way to do this are not along the commonly accepted lines, and I present them in the hope that they will not only stimulate discussion, but research on the part of the profession.

The general shape and arrangement of the teeth of man are such as to indicate that his food has been a mixed diet of fruits, cereals, and meats, in more primitive times. It is probable that the race has existed at least 50,000 years, and a very large proportion of the earth's inhabitants have for all that time, save in the last fifty to two hundred years, lived decidedly simple lives compared with our present-day living. At first all fruit, cereals, and meat must have been consumed in the raw and uncooked

state. This meant severe demands upon the organs of mastication, and there were developed accordingly tissues to meet these demands—hard and indestructible teeth and tough and resistant mucous membrane, firm and strong bone support for the teeth in the alveolar process—and all these tissues were kept in efficient condition by the strenuous exercise demanded of them to perform their normal function.

Later, fire was utilized for cooking the food, and the hard and coarsely ground cereals were cooked and their cells broken up and made softer, also the tough fibers of meat were cooked and their toughness reduced. This left a decreased demand upon a series of organs beautifully developed for their particular function, and a mild reaction toward degeneration must have set in, and there being less friction upon the teeth and gums their tone became lowered.

With modern methods of preparing our cereals by fine pulverizing, and of softening the meat by cold storage, still less demand is made upon the masticatory organs, and there being no exercise to keep up their condition there ensue flabbiness, lack of tone and inability to retain the healthy condition found when their functions are fully exercised.

Added to this is another difficulty. The strain upon the whole digestive process has become very greatly increased, owing to the variety of food-materials now procurable. This is due to improved transportation facilities and new methods of preservation and of preparation. While these modified foods are pleasing to the palate, the digestive system cannot at once adjust itself to new conditions, and there results increased tendency to faulty metabolism and imperfect assimilation, resulting not only in defective nourishment but in imperfect work by the secretory and eliminative organs, and thus the fluids that surround the teeth become abnormal and favor external destructive agencies rather than destroy them, as they would under normal conditions.

Now, the method of attempting to supply to the fluids of the mouth the power of protecting the teeth from destruction by various agencies, by making the fluids of the mouth aseptic or antiseptic, is to a large extent absolutely futile, as any local application that may be utilized exercises its properties for only a comparatively few moments after being used. Its power is

rapidly dissipated by admixture with the mouth fluids, and as they are manufactured and supplied constantly, they in a very few moments set up the same conditions that previously existed. The only way I can see to remedy the quality of the fluids surrounding the teeth is by general treatment, so that the various glands will secrete normal fluids. This and the judicious use of mechanical cleansing, as I will now describe, are the rational prophylactic measures.

If the *tissues* of the mouth have been properly developed by rigid demands, such as the necessity of properly grinding unground and harsh cereals and tough and fibrous meat, it would follow that a change to soft and mushy food that takes place more rapidly than nature could adjust the less used organs to this modified nutrition must result in a general deterioration of the involved organs. This accounts for both insufficient room in the alveolar process and the easy destruction of this process through pyorrhea alveolaris. This condition can be improved locally, as well as by general treatment, by the judicious and energetic use of the tooth-brush, especially just before retiring; and by the energetic I mean the careful and vigorous brushing of the surface of every tooth, and also just as vigorous brushing of the soft tissues of the mouth; that is, the *entire* surface of the mucous membrane. If this be done the circulation and the normal nourishment of the parts is stimulated, as well as the elimination of waste products. I believe the thorough cleansing of the mouth and teeth just before retiring will also be in most instances of benefit to the stomach and entire intestinal canal, as it will prevent the products of fermentation and putrefaction from being carried into the stomach throughout the night. It would seem, then, that any form of brushing which would thoroughly cleanse the teeth in the young, and also be of sufficient value as a massage to stimulate both firmness and resistance in the mucous membrane of the mouth, would be as efficient a method of preserving these parts in a state of health as could be devised.

The use of powder for cleansing and of a wash for its local effect upon the mucous membrane may be of value at times, but in my estimation they are not necessarily to be used constantly, but only under the advice of a competent dentist, and then only when some specific condition seems to demand them. The un-

limited use of the various washes used for the mouth I regard as extremely pernicious and harmful, unless the wash is a mere toilet article with practically no medicinal qualities. The careful use of floss silk under the instruction of the dentist may be permitted, but it is not essential in all cases. The teeth and gums cannot be brushed too vigorously, even almost to the point of laceration of the gums. The situation being that, owing to the changed conditions that confront the teeth, nature has not adapted herself entirely to these changes, and to help the organs retain the greatest possible efficiency there must be stimulated as far as possible conditions such as lead to a normal development of organs and tissues.—*Dental Cosmos*.

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CONSTRUCTION OF ACCIDENT POLICY COVERING BLOOD POISONING SUSTAINED BY PHYSICIANS, SURGEONS AND DENTISTS THROUGH WOUNDS. The United States Circuit Court of Appeals, Eighth Circuit, had, in Fidelity and Casualty Company of New York vs. Thompson, an action brought by the latter party on a policy of insurance "against disability . . . resulting directly, and independently of all other causes, from bodily injuries sustained through external, violent and accidental means," wherein it was declared: "This policy, subject otherwise to all its terms and conditions, covers blood poisoning sustained by physicians or surgeons resulting from septic matter introduced into the system through wounds suffered in professional operations."

There was evidence tending to show that the plaintiff, as stated in the policy, was an operating dentist; that during the life of the policy a patient, on whom he was in the act of professionally operating for affected teeth, suddenly coughed, and thereby particles of the septic matter were conveyed from the patient's mouth to the conjunctiva, or mucous membrane, of the plaintiff's eye; that the septic matter infected this membrane and was thus introduced into his system, and that he was in consequence wholly disabled from practicing his profession for a period of ten weeks, and partially disabled for succeeding period of twenty-six weeks. There was also evidence that he felt the impact of the particles on the surface of the eye, but no evidence that it produced any pain at the time, or abraded, penetrated, broke or bruised the conjunctiva, or that

the septic matter was introduced into his system otherwise than through the process of infection, in like manner as if the particles had entered the nose, mouth or throat and had lodged on and infected the mucous membrane thereof.

The defendant company requested the trial court to include the following in its charge to the jury: "You are instructed that, by the terms of the plaintiff's policy of insurance, it is made to cover blood poisoning sustained by a physician or surgeon resulting from septic matter introduced into the system through wounds suffered in professional operations; but you are also instructed that there is no evidence of the plaintiff having received any wound, and he must recover, if at all, on other provisions of the policy." But the court denied the request, and included in the charge the following definition of the word "wound," taken from the Century Dictionary: "In surgery, a solution of the continuity of any tissues of the body, involving also the skin and mucous membrane of the part, caused by some external agent, and not the result of disease. In medical jurisprudence, any lesion of the body resulting from external violence, whether accompanied or not by rupture of the skin or mucous membrane—thus differing from the meaning of the word when used in surgery."

Without doubt, the Court of Appeals says, it was essential to a right of recovery under the provision relating to blood poisoning that the septic matter should have been introduced into the system through a wound. What, then, is a wound within the meaning of this provision? No purpose would be served by stating the various meanings ascribed to the word by lexicographers, writers on medical jurisprudence, and judges, for they all recognize that one of its well-recognized meanings—that principally employed in surgery—includes an abrasion, breach or rupture of the skin or mucous membrane, whereby animal venom or virus, or some impure, poisonous or irritating matter, may gain entrance to the underlying tissues and contaminate the blood; and this, as the court thinks, is the sense in which it is employed in this provision. It is there used only in respect to physicians and surgeons when performing professional operations, and then only in respect of a bodily injury through which septic matter may be introduced into the system and result in blood poisoning. Plainly, therefore, it refers to such a wound as removes the protection given to the tissues and blood by the skin and mu-

cous membrane and so permits of the introduction of septic matter capable of poisoning the blood; in other words, it refers to an abrasion, breach or rupture of the natural covering through which the septic matter may gain entrance.

As so employed, it does not embrace such a wound as is described in this latter portion of the definition given in the charge, and does not include the blowing against the eye of that which does not mechanically abrade, break or rupture the conjunctiva, but merely communicates to it an infectious disease by contact with its outer surface. So far as was disclosed by the evidence, the immediate effect of the particles blown into the plaintiff's eyes was not different from what it would have been if they had consisted of so much pure rain water; they did not wound it, but infected it from the exterior, operating in like manner as do some other species of infecting matter when they come in contact with unbroken skin or mucous membrane of other parts of the body. Indeed, it appeared that the pathogenic germs in what was blown into the eye were chiefly pneumococci, which if carried into the lungs, produce pneumonia; but it would not be said in such a case that the infection of the lungs was through a wound.

The conclusion is that the instruction requested should have been given, and also that the latter part of the definition given to the word "wound" was rendered inappropriate by the other terms of the provision relating to blood poisoning.—*Journal American Medical Association.*

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PRACTICAL POINTS IN DENTISTRY. By S. D. Ruggles, D.D.S., Portsmouth, Ohio. After giving the college full credit for its share in the preparation of men for their life work, there still remains one obstacle which we must all encounter, viz., the consciousness of being new and untried. This is perhaps the most trying ordeal with which the young practitioner has to deal, and for him especially is this paper written. Following a **schedule** mapped out by the faculty is an easy task compared to making and executing one of your own, which involves business and professional principles entirely foreign to your previous experience. Fortunate indeed is he who casts his lot with an old practitioner, for many a pitfall is avoided when a little good counsel is available. The man who is ultimately successful by

virtue of his painstaking and thorough methods often suffers more at first from lack of confidence than the less skilful, for he realizes that experience will be his best teacher. Under such circumstances the value of association is obvious.

One safe way to avoid mistakes is not to attempt the impossible. College experiments may often prove your undoing; choose rather to make a good impression by executing a simple operation well. The making of a reputation requires time, even in this twentieth century.

I once heard a very prominent merchant say: "Clean linen and well-brushed clothes are a man's best assets for a good impression." This century finds the public well versed in hygiene, and it behooves one to never lose sight of this fact. Soiled linen and dust-covered furniture are not fit testimonials, even for the man of known ability. Above all else, be cleanly and neat, for the majority of patients are ladies, and these things are all noticed. Have your operating room and chair appear for each patient just as though he was the first to occupy it that day. All instruments should have a place, and let that place be under cover. A word about sterilization sometime during the sitting will not be amiss. Better still, should you not have an office girl, gather up the instruments while the patient is rinsing the mouth preparatory to leaving the chair. It will be noticed.

Did it ever occur to you that the dentist's manner and speech are almost as important factors in practice as the ability to read character? The family physician often benefits his patient more with a cheerful greeting than with his prescription, and what you say to your patient has its effect. Not long ago I was surprised by the mother of a first-year high-school boy when she told me of a conversation I had with her son many months before. Confine your remarks to things of interest and within the comprehension of your listener. Some patients care for very few remarks, and a close observer will notice this. The custom of a warning when pain is to be inflicted is usually very welcome, but some are willing to omit even this. Let your voice be low and words carefully chosen, and above all else, refrain from references to your own accomplishments. It is right and proper to talk shop in your own office, but never outside of it.

Proceed with the work systematically, recording each item in a book or on a card for this purpose. For young patients who are not accompanied by parents, it is good practice to have the mother come to the office and talk matters over in detail. Explain the difficulties of the case and state what, in your opinion will be the best thing to do. Emphasize the fact that fillings are but patchwork, and their permanence depends largely upon the care they receive subsequently. It is often advisable to give some idea of the probable cost. This is wise, for it may prevent a misunderstanding, one of the very important things to avoid. These estimates are written in a space provided on the examination blank. Many points are to be considered in this particular phase of the work, the health, the financial condition, intelligence and appreciative ability of the patient.

When the physical condition is such that the more permanent operations do not seem advisable, do not commit yourself until an investigation is made. The family physician is always glad to advise, and under such circumstances no fault is apt to be found with your results. It is to be regretted that we have no means of knowing a patient's financial standing. Certain of the more expensive operations are advisable when the cost does not enter into the consideration. In small towns the financial condition of the residents is usually known, and the city practitioner need not be entirely ignorant if he is sufficiently interested. Appointments can frequently be arranged, allowing the necessary time for inquiry, or should it be an emergency call, give such relief as is needed, and then place your next appointment far enough ahead to serve your purpose. It requires very little experience to judge a patient's intelligence. The request for a tomato can on an incisor will soon put you right.

Now and then patients present who might be termed incompatibles, and for these your best efforts will result in failure. The experienced anesthetist knows very well that the success of his anesthetic depends largely upon the frame of mind of his patient. For those who are not in sympathy with your endeavors, who question your sincerity or ability, the sooner they are invited to seek other services the better.

The rapid progress made in dentistry in the past decade has

so impressed the laity that sometimes the impossible is expected. For instance, some root canals can not be filled with absolute certainty, and why should we be ashamed to acknowledge it? Cases frequently present that are beyond human power to restore, and why not use common sense and say so? People with reasonable intelligence can be made to understand these things if you will but tell them beforehand, and it is your duty to do it. Physicians usually explain the chances in favor of or against recovery.

The financial side of dentistry is a subject of itself. Suffice it to say, "The laborer is worthy of his hire," and bills should be rendered the first of the month.

This is a busy age. Time is worth more than money, if such a thing is possible; therefore the necessity for promptness, both on the part of the patient and dentist. Have your office hours, and see to it that they are observed. It has been my custom for several years with certain patients who are deeply engrossed with business cares to notify them by telephone of the time agreed upon for their next appointment. Sending reminders by mail was a failure, for most of them were pigeon-holed. This liberty is taken only with those who are in sympathy with the idea and are old patients. An early-morning appointment often appeals to a busy man, and this you might easily grant, for I know of no better time to work than early in the morning, when you feel well and have not used up all your energy. Under no circumstances consent to working on Sunday. The patient who is too busy to have his work attended to during the week is either a thoughtless and poor manager or a wilful desecrator of the Sabbath. Half holidays during certain seasons and an annual vacation eliminate this factor entirely if you insist upon it.

In concluding, let me emphasize the necessity for reading good dental journals and publications by our best authors. Make it your business to be a regular attendant upon your dental societies. Patients like to patronize a well-posted, up-to-date man, and you will not only rob yourself, but him as well, if you fail in this particular.—*Dental Summary.*

SOME CONSIDERATIONS IN ROOT TREATMENT. By J. W. A. MacGowan, L.D.S., Glasgow, Scotland. In regard to the treatment of an exposed pulp, where such exposure is due to caries, I have lost much of the faith I once had in the efficacy of pulp capping, and even where the exposure is traumatic, I have considerable searching of heart as to whether it would not be better in the end, both for patient and operator, to extirpate the pulp at once. The delicate structure of the pulp, its extreme susceptibility to thermal change, and the uncertainty as to the possible presence of bacteria, are all considerations which make it doubtful whether safety does not lie in destruction of the pulp, even in cases of traumatic injury.

There can be no doubt that great satisfaction is to be derived in the case of an exposed and irritated pulp which completely recovers under the pulp-capping treatment, the result being especially worth attaining near the front of the mouth, where retention of color is such an important consideration. Though, as all of us know, the removal of the pulp need not lead to any marked change in the shade of the tooth in the majority of cases, while the fairly efficient blood and nerve supply from the pericementum guarantees quite a long period of usefulness. Certainly pulp capping would in all cases be preferable if one could feel reasonably sure that complete recovery of irritated pulp had taken place, or even that if the pulp did die under the capping it was reasonably certain that it would be found in the innocuous, mummified condition which sometimes occurs when a pulp has died as the result of a blow, and there is no external communication. But if death of the pulp results, and the measures taken do not prevent the occurrence of putrid conditions within the canal, then the last state of that tooth is worse than the first, since we have an apical condition, which the earliest and most energetic treatment may fail to overcome, and indeed the most careful treatment sometimes appears almost to light up the condition of acute alveolar abscess which we are earnestly trying to avert.

And again it has frequently afforded me food for reflection, that in cases of acute alveolar abscess, arising in circumstances which preclude the possibility of direct pyogenic infection, where the pulp has died for any reason with no external communication, how have the bacteria got access? The theory that they are al-

ready circulating in the blood, and ready to spring into full activity as soon as the death of the pulp has given them a suitable sphere of operation, seems to give a dead tooth with thoroughly cleansed and filled root canals a doubtful chance while there is the pericementum still open to attack. Root treatment and filling would in such circumstances mean that we were doing away with only one vulnerable point, and the operation would have no finality about it. It is admitted, I understand, that bacteria may enter the body without causing any change at their point of access, and carried along by the blood stream, may by their products set up inflammatory conditions at very distant points. And it has sometimes been a comfort to me to think after having exerted all the skill and care at my command, in the destruction of the pulp and the filling of the root canals, that a subsequent alveolar abscess was due, not so much to the possible introduction of pyogenic infection by faulty manipulation as to an assault of bacterial products carried by the blood stream from a distant point, on a tissue whose vitality had been lowered and rendered susceptible to their malign influence. It is the only satisfaction to be got out of an unfortunate situation, unless we fall back on the device of blaming the leucocytes for failing to perform properly the functions credited to them by Metschnikoff. And again it might be difficult to convince a patient that we were not trying to obscure the issue by assuring him that the cause of the abscess at the apex of a bicuspid root which we had just been treating was due to the production of injurious chemical substances in his liver or kidneys over which he really ought to exercise more control.

However, if the difficulties and possibilities were always before us, it would be little that we would achieve, since we would be afraid of the pulp alive or dead, and if the dangers incident to the surgical treatment of the tooth pulp constrain us to acquire greater skill in the handling of it, and fuller knowledge of methods of treatment and the action of the drugs we use, I suppose these difficulties and dangers will have served a useful purpose, which is another comforting reflection.

In considering the question of pulp capping, it sometimes happens that we have to take into account, over and above the condition of exposure, the possibility of the perverted activities of

the pulp having given rise to that morbid condition which we know as pulp-stone.

This condition, arising mainly as the result of slight, though long-continued irritation, indicates the probable treatment as devitalization. In one case, however, that came under my own observation there was entailed a considerable amount of labor, which might have been avoided had that course been followed. The patient presented himself, having a carious lower second bicuspid in which was a small exposure; the cavity being quite easily accessible, the pulp was capped in the usual way, a metal cap containing a paste formed from oil of cloves and zinc oxid being used, and the tooth cavity was immediately filled. For some few weeks the tooth was free from pain and the pulp apparently recovered from any irritation present at the time of treatment, but subsequently there was a history of occasional neuralgic attacks, which came and went with no apparent exciting cause so far as the patient could determine; by this I mean that thermal change, or pressure of mastication, was not given as the cause of the attacks. The tooth being opened for the purpose of devitalization, I was astonished at the extent and density of the secondary dentin which had been formed, considering the interval of time which had elapsed from the date of capping. The pulp was treated with arsenic trioxid and removed forty-eight hours later with some difficulty and considerable pain to the patient, when it presented all the appearance of the process of calcification in the middle third of its length. The affected portion was not absolutely hard, but of that hardness which allowed of some bending short of the breaking point. Whether the calcification was due to irritation arising from the exposure or arose as the result of the activity of the pulp in protecting itself by the formation of secondary dentin I had no means of knowing; though my inclination was to believe that if the deposit within the canal was of the nature of pulp-stone, it must have originated about the time of capping, since symptoms pointing to the condition were entirely absent previously.

Another case which came under my observation was in a patient, one of whose upper cuspids had been filled some years previously, and on account of some defect the filling was removed and devitalization resorted to. The pulp was partially calcified,

and a casual remark to that effect being made, the patient remarked that it was only some more "writing on the wall," as he had been informed by various medical men that, owing to a calcareous deposit in the walls of his blood vessels he would require to live very carefully or the condition would, as he put it, "wind him up" sooner than he considered reasonable.

The difficulty of diagnosis in some cases is perhaps an argument in favor of more frequent devitalization.

It has been advocated by some that a large majority of unhealthy pulps can be restored to health and subsequently capped, even in cases where suppuration has destroyed portions of the pulp tissue, to such an extent as to leave the pulp chamber only half full; and there is in existence a treatise on the antiseptic treatment of the pulp which advocates the retention alive of even small portions of pulp tissue in root canals, which, personally, I would be rather disposed to look upon as a calamity, if it happened accidentally, through failure to compass complete removal, and my feeling in such a case would be to regard that tooth with suspicion and remain ready for developments.

The chief consideration in pulp capping appears to me to be avoidance of all pressure in making the filling, and a paste formed of oil of olives and zinc oxid to cover the actual exposure, and contained in a metal or celluloid cap, has given me as satisfactory results as anything I have used. One preparation, which acted on the pulp by liberation of formaldehyd gas, resulted very often in my hands in the death of the pulp; though frequently, following its application, the irritated pulp seemed almost at once to be restored to the normal condition so far as pain was concerned, which made it tempting to use. Oil of cloves, creosote, thymol, dilute phenol, all are recommended, but the actual drug left in contact with the exposure does not affect the result so much as to make it a matter of very great importance which of them all our particular preference leads us to depend on. I have no desire to deny the advantages of retaining the pulp alive, if it be possible, but if in spite of careful and conscientious endeavors the results can only be described as fairly satisfactory, my preference in cases which are in the least doubtful is for the radical treatment of extirpation, with the exception, perhaps, of teeth near the front of the mouth, or in the case of inac-

cessible second or third molars, in which latter case the pulp may get another chance on the principle that "sufficient unto the day is the evil thereof," as there may be small chance in any event of satisfactory root treatment and filling.

A good deal was at one time heard of the treatment known as mummification, and though it did not fulfill all that it appeared to promise, and that some claimed for it, still it has its uses. The ancient Egyptians contrived to embalm their dead so that the bodies are preserved to the present day, and the tanning of hides, or even the tinned meats of Chicago, go to show the possibilities of the process. Provided it were possible to kill the pulp, and then, by the use of suitable astringents and antiseptics, to so treat it that its presence in the canals would be absolutely harmless, we would have quite a simple and desirable state of things. The unfortunate feature is that inaccessibility to external influences is not possible of attainment in many cases, and the breaking down of cavity margins, or the commencement of decay at some fresh point promptly undoes all that the mummifying agents have achieved by the admission of the fluids of the mouth; while, if the theory is correct, that bacteria and their products are circulating in the blood ready to pounce upon a dead pulp, the astringents and antiseptics used would require to be of such strength to resist the attack that there would also be the possibility of pericemental trouble arising through the irritant action of the drugs. The removal of that portion of the pulp tissue which lies within the pulp chamber and the application of mummifying agents to the canals without disturbance of their contents is justly, I think, more condemned than advocated, and only where it is impossible, mechanically, to clear the canals thoroughly is the procedure justified, since the conditions under which the embalming processes have to be carried out do not make for efficiency. The preparation of which I have made most use is a paste formed of thymol, alum and glycerin.

When removal of the pulp has to be undertaken the advantages of the immediate method, by the use of various local anesthetics, as compared with the use of arsenic trioxid, are so obvious as to require little comment, though a good deal depends upon the patient as well as on the operator for complete success. The use of adrenalin chlorid to control any subsequent hemor-

rhage, as recommended in many text books, seems a little unsafe, in so far that being difficult to keep pure, it might furnish a possible means of infection. The use of tannin also, as recommended for hardening the pulp after treatment with arsenic trioxid, is in most cases unnecessary, and personally I have never found the removal of a pulp facilitated by the use of any astringent preparation, though they are useful in controlling hemorrhage after the removal of the pulp by either method.

It is when we are called upon to treat the condition involving alveolar abscess that root treatment makes the largest demands upon our patience and experience. It does not always happen where the same methods and care are expended, and the general conditions are apparently similar, that the results are as equal as might reasonably be expected. It used to be worrying to me to read papers on this subject which appeared occasionally in dental magazines, and gather from them that some practitioners were always able to plumb the depths of the longest and most tortuous canals, restore to health roots affected by the most virulent abscess, and fill the canals with ease and certainty. It has not been given to me to attain such satisfactory results, and one can only live in hope and recall the dictum against "envy, malice and all uncharitableness."

When the inflammatory condition has reached the incipient abscess stage the opening of the pulp chamber sometimes results in dire consequences, even if our movements seem to be even more than stealthy, and the abscess which forms in such a case is usually of a very painful type, which Mr. Lloyd Williams pointed out "was possibly due to the fact that new tissue forming about the apex of a root as the result of inflammation is very fibrous, the fibers lying parallel with the root, which would in some cases account for a small quantity of pus being formed, since infiltration of such tissue by the leucocytes would be comparatively slow."

The treatment of severe and recent abscesses yields much better results as a general rule than those of the chronic kind with a sinus, while the chronic abscess without a sinus often has proved, in my experience, quite indifferent for weeks together to flooding with every conceivable drug that the wits of many men have suggested. The making of a sinus, where none has

previously existed, is, I think, the most important point in the treatment of such cases, since, though it may be possible to get very free evacuation of the pus through the canal, the welling up of the pus is sometimes so persistent and so copious as to compel one to speculate where on earth it is all coming from. The making of an artificial sinus through the gum and alveolus is, in my opinion, more likely to ensure the complete passage of anti-septics throughout every part of the abscess cavity, whereas it is by no means certain that where there is no sinus, our disinfectants can be utilized with much effect beyond the apical foramen. It used to be quite a usual procedure with me to open up such canals, where they were straight and easily accessible, to the extent of widening the apical foramen and drawing blood, but the difficulty of subsequently closing the apex has led me to abandon the practice. Now I place more dependence on the making of a sinus and enlarging of the canal as near to the apex as seems safe, and allowing longer time for the dressings to take effect.

Cessation of the discharge, the condition of the dressing when withdrawn from the canals, and the absence of all discomfort I accept as evidence that the canals may be filled with reasonable hope of no further trouble. The free opening up of the canals with reamers, provided it can be accomplished without risk of perforation of the wall of the root, seems to be a most reasonable procedure, since one cannot but suppose that the walls of the canals after long soaking by decomposed fluids would require almost an equally long drenching with powerful anti-septics to restore the dentin and its tubules to an aseptic condition, so that the cutting away of the immediate surface will leave our drugs in contact with dentin which has not been impregnated with foul matter to the same extent and will be more speedily rendered aseptic.

The advocates of immediate root filling argue that once the canals are opened up, cleansed and disinfected, no further irritation should arise, and that if it does it ought to be treated through the gum and alveolus, since it is useless to open the canals when they are in an aseptic condition.

This method I have tried in a few cases and the results were

as satisfactory as could be looked for, though it should be said that the root filling used was of the kind that is easily removed. There is this to be said for this treatment, that granting the canals can be rendered aseptic at one sitting, and that subsequent irritation arises, it is probably due to roughening or some other alteration about the apex of the root, which would possibly render futile any form of root treatment whatsoever except extraction. The whole matter turns, I should think, on the possibility of immediately rendering the canals aseptic, and with many I should consider that extremely doubtful.

The question of root filling materials is one on which all of us will have our own opinions. The principal considerations are to use such a material as will effectually seal the canal, which can be easily inserted and as easily removed, besides being of such a nature as to cause no irritation. All of these conditions are by no means easily fulfilled by any one substance. Gold foil and tin foil are among the number recommended, but I do not know anyone who uses them. The difficulty of introducing them, I should imagine, must more than outweigh any advantage they may possess. Zinc oxychlorid is difficult or impossible to remove from some canals should such procedure unfortunately become necessary. I say it with all deference to those of you who are "immediate root fillers." Root filling with foil could only be applicable to the widest and straightest canals and does not appear to possess any advantages over some of the simpler methods. Zinc oxychlorid pumped into canals with wisps of cotton is likely to produce a piston action which would be dangerous if any septic matter had by chance not been removed. The same thing may be said of chloropercha and guttapercha points, but this material has the advantage over the others of easy removal and it is possible to incorporate with it some disinfectant such as iodoform, or the guttapercha point may be dipped in an antiseptic before being inserted. This material has been most satisfactory to me and I can see no advantage in discarding it for more permanent substances. Paraffin was strongly recommended and was used in a medicated form, its introduction by means of hot wires being said to be easy and effective, the melting point being low; but it was found that canals filled by

this method were often found, shortly after, to be aseptic but empty, presumably owing to absorption of the material by the dentin, and this substance has been abandoned by the operators who commend the method in favor of wax possessing a higher melting point, the chief points in its favor being that it is easy to introduce, effectively seals the canals, and being absolutely non-irritant possesses an advantage over chloropercha, which, if pumped in with too much vigor, may cause irritation in the apical region. It is probable that in the treatment of putrid conditions within the canals, more diversity of opinion exists in regard to the value of the drugs at our command, in bringing about a healthier condition, than in the actual manipulation of them; though I have a vivid recollection (talking of manipulation) of an occasion on which I used sodium peroxid for the first time. It is quite a number of years ago and I was not in practice at the time. I was using it in a root canal, and without appreciating its possibilities thoroughly had placed a quantity of the dry drug within, intending to dissolve it in position, as it were, and get the full benefit of the resulting liberation of nascent oxygen, but the energy of the chemical action set up in the confined space amounted almost to a minor explosion, which so startled me, not to mention the patient, that I abandoned its use until I had obtained a broader acquaintance with its properties in full strength. I find it desirable now to add the powder to water, and not the water to the powder in dissolving it. The sodium peroxid I have since found most satisfactory in use, even more so than the hydrogen peroxid, the chief difficulty being in keeping it at full strength. Particularly is this the case with sodium peroxid after the sealed tin is first opened. The exposure to the air seems to cause most rapid deterioration in spite of most careful waxing up after the necessary amount has been withdrawn. This, I understand, is due to the formation of the hydroxid.

Sulphuric acid and sodium bicarbonate have the advantage over both the peroxids in so far that the free liberation of oxygen can always be depended on without any question arising as to whether the fluid is sufficiently fresh,\* the action of the acid

\*When sulphuric acid acts upon sodium bicarbonate, carbon dioxid is the gas liberated and not oxygen as— $H_2SO_4 + 2NaHCO_3 = Na_2SO_4 + 2H_2O + 2CO_2$ .—Editor Dental Digest.

in say a 50 per cent solution being of some advantage in widening the smaller canals.

Tables have been published giving the approximate efficiency of the various antiseptics most in use, but in regard to one published by Professor Miller, he himself pointed out that for practical purposes it was unwise to place too much dependence on any table, owing to the fact that some of the drugs could be used in full strength, while others, owing to poisonous and escharotic properties, must only be used in dilute solutions, many of them of varying strength.

Again, many of the antiseptics act only by hindering the action of the bacteria, others by destroying them entirely. The weaker solutions of phenol only inhibit the action of the bacteria, and that for a very brief time. In full strength it destroys. Though its action is strongly escharotic, throughout an abscess cavity and its communicating sinus, in practically full strength, it is usually most effective, and any irritation it may set up is of a healing type, being in this respect something like iodin. It has also appeared to me that in pumping phenol in strong solution throughout an abscess cavity and sinus it is rather an advantage to be certain of its free passage throughout the whole tract by the slight escharotic effect visible at its point of exit. Where such drugs as creosote and creolin are used, more reliance has to be placed upon sense of smell, where very free passage of the solution is not attainable; while it is not always an advantage that the heavy penetrating odor of creosote, or oil of cloves, should predominate over any foul odors, which might be recognized were a less pungent antiseptic in use.

Mercuric chlorid is apparently the most powerful bactericide known, but its service is most safely limited to roots of teeth away from the front of the mouth, owing to the blackening which may ensue by formation of the sulphid. In contact with steel instruments it loses its antiseptic properties. The only use I have made of it was in some cases where it was found impossible to completely remove the pulp tissue in fine canals, a minute quantity of the drug in solid form being worked into the canals and left there permanently; its power of penetrating and mummifying tissue is said to be very considerable, and the results in such cases I have found quite satisfactory.

The proprietary articles are daily increasing in number, and while some are of a kind that apparently only require sealing up in the pulp chamber of a suppurating tooth to effect a complete cure and a saving of the operator's time, others of them give good results when used on orthodox lines.—*Dental Record.*

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HOW SALIVARY CALCULUS IS FORMED. By W. A. L. Knowles, M.D., D.D.S., San Francisco, Cal. Our patients frequently ask us dentists to explain to them the process by which their teeth become coated with accretions of calcium salts. They have often maintained very erroneous ideas in regard to it, many supposing it to be the cause of decay and some even considering it beneficial in cementing loose teeth in position and offering protest to its proposed removal.

While there is nothing new in the subject-matter, for this has been threshed out long ago, the manner in which it can be explained to the patient's satisfaction may not be without interest. It should be elucidated somewhat as follows:

The deposit upon the teeth is largely a limestone formation, somewhat similar to the crust of lime which forms upon the inside and bottom of the tea-kettle from water evaporation. It is a natural constituent of the saliva, being excreted from the body through the salivary glands. Its manner of deposition can be explained by chemistry.

A chemical law is that a phosphate held in solution, in order to have that solution clear, must be slightly acid in reaction, otherwise a precipitation of the contained salt will occur.

The parotid gland produces saliva in the greatest abundance, being the one which is said to cause the mouth to "water" when one thinks of something good to eat or whose nostrils detect the odor arising from the cooking of some appetizing food. Being the one which secretes the largest quantity of saliva, it would naturally be the one to contain the greatest amount of earth salts, and requiring them to be in a state of complete solution, we would necessarily find that the secretion entering the mouth at this point would be acid in reaction.

Were there no other provision in nature, the mucus also being acid in reaction, the continued presence in the mouth of these

acidulated fluids would soon dissolve the teeth and the individual so affected would become toothless.

The saliva as a whole, however, is composed of the admixture of four secretions—those from three sets of salivary glands and the mucus. The secretion from the sublingual as well as that from the submaxillary gland is alkaline, and when the four secretions are properly mingled in health there is a neutralizing of the acid secretions and a saliva resulting which is neutral or slightly alkaline.

This brings us again to our law of chemistry and we find that while the calcium phosphate was in clear solution when ejected from the parotid duct, as soon as it met the other alkaline solutions, the reaction was immediately changed and a precipitation of the calcium phosphate occurred, which, by the action of gravity, is most profusely distributed upon the lower oral teeth for the reason that the body is in the upright position the greater part of the twenty-four hours, and this, being the lowest point, receives the primary deposit.

Another favorite spot for the deposit to occur is upon the cheek face of the second molars, which are almost directly opposite the point in the cheeks from which the parotid secretion is poured into the mouth.

This precipitation of the contained salts may be illustrated in several ways. If you take a glass of lime water which is perfectly clear and limpid, and through a straw or glass tube blow the breath into its depth, causing the solution to bubble, you will soon notice that the liquid has become cloudy, and if you allow it to remain undisturbed will notice that it finally becomes clear once more, but you will find a white deposit in the bottom of the glass.

First you had the calcium hydroxid, and, after you had introduced the carbon dioxid contained in the exhaled breath, a new chemical compound was formed, calcium carbonate, insoluble in water, and which fell to the bottom in the form of powdered chalk, leaving only water in the glass above the precipitate.

Another experiment is to place some quinin sulphate in a glass of water. It floats upon the surface and is very slightly soluble, but add a drop or two of sulphuric acid and notice how quickly it will dissolve.

Having now learned that the deposit is alkaline in its reaction, and being taught that decay of teeth always requires the presence of an acid, it will be readily understood that the deposition of this calcareous material and the concurrent decay of teeth at the same place cannot occur, for if tartar forms at this point there can be no decay as there is no acid, and, on the contrary, if there is acid in sufficient quantity to cause decay, it will prevent the precipitation of the calcium salts and there can be no tartar deposits.

Tartar may be found in process of deposition in one portion of the mouth and decay may be simultaneously occurring at another point, but never together at the same place at the same time. A tooth may have partially decayed and, later, by a change in the reaction of the secretions, become coated with tartar and the cavity of decay may have been completely filled with a natural stopping of tartar. On the other hand, it is not impossible that teeth which have once been coated with tartar may have some of the tartar again dissolved by acidity of the secretions which attack the tooth structure at this point.

This tartar will be deposited anywhere within the mouth, getting under the gums, where it does the most mischief, and also being deposited upon artificial dentures or orthodontia appliances which may be in the mouth. It even coats the inside of the tubes of the saliva ejector which conveys the saliva from the mouth.

It has been called a disease of good health, if such a thing is possible, for it is usually found in the greatest abundance in the mouths of good livers. We may, therefore, look for tartar deposits in persons who suffer from gouty or rheumatic trouble, it being the deposit of a similar material in the joints of persons so afflicted.

Dyspepsia, and especially in that form in which sour eructations occur in the mouth, is seldom accompanied by the deposit of tartar, but is found in connection with decay of the teeth.

Any so-called preparations for dissolving tartar should be avoided, because that which is capable of dissolving tartar would quickly dissolve tooth structure.

Should any foreign body become lodged in the opening or tract of any one of the six salivary ducts, it will soon become coated

with a deposit of salivary calculus, which will be limited in size only by the stretching short of the point of breaking, of the soft structures surrounding them. This condition is sometimes met with in the human mouth, where concretions will form as large as a marble, and in the case of horses, in whose salivary ducts an oat or other foreign body may become lodged, the size of the mass may be as large as a pigeon's egg.

In old age the same material deposited in the coats of the blood vessels renders them as brittle as pipe stems, and in the muscles it produces the so-called ossification or turning into bone.

A homely illustration of the presence of the salts in the saliva is called to mind by the fact that almost every child has spat upon the top of a heated stove or other surface and watched the resulting white spot appear, demonstrating by the evaporation of the water the presence of the calcium salts which produce the white spot.

There are many ways where it is possible to give a patient a common-sense explanation of matters pertaining to our art, which should be and probably is interesting to him, and we should always be willing to impart such information.

A theory has been advanced to the effect that carbon dioxid in the mouth has something to do with the formation of salivary deposits by uniting with the calcium contained in the salivary secretions. This does not appeal to me as a correct statement.

The contained calcium is not in the form of an oxid, but as a salt, and there is no calcium salt known to me which is capable of being dissolved by carbon dioxid. All carbonates are unstable compounds and yield to and give up their carbon dioxid to any other acid, weak or strong, forming new salts. This is particularly true of phosphates, which yield to but few other acids.

In the table of elective affinities there are but four acids which precede phosphoric in its affinity for calcium—oxalic, tartaric, succinic and sulphuric.

The enamel of teeth, which owes much of its hardness to calcium phosphate, is not commonly dissolved, but breaks down in masses. The body of the tooth being largely composed of carbonates is readily dissolved by any acid, carbonates, as previously stated, being exceedingly unstable compounds. These acids hav-

ing obtained entrance into the body of the tooth, the dentin, through some fissure, pit, crack, imperfection or abrasion in the enamel, hollow out a large cavity and the enamel being left without support is crushed in by stress of mastication and broken into fragments. This explains the sudden appearance of cavities in the teeth unsuspected by the patient and, alas, occasionally by the dentist.

Among the many incidents coming under my notice during the many years of practice none is more vividly impressed upon my mind than one which occurred during my college career. This particular case came before the class of 1878-9 in the clinic of the late Professor Garretson.

One of the patients presenting at the dental infirmary was an old lady who had an immense tumor under the tongue. It had been growing for years, was larger than a good-sized marble and had been pronounced by several of the lady's friends to be a cancer. She had been warned that if it were once cut into she would be liable to lose her life.

Professor Garretson immediately recognized the nature of the tumor and wished to split open the sac and remove the contents. But the lady would not give her consent, though she promised faithfully to return on the next clinic day and report.

When next she came, Professor Garretson concealed a bistoury in his hand and, while examining the tumor, deftly split the membrane covering it, and out popped the enclosed mass of calculus. Of course, the lady was ready to faint from fright and went home to make her will and bid adieu to her friends, but in a week she came back smiling and reported good health and no cancer.

Professor Garretson begged the lady to allow him to retain the calculus that he might deposit it among the curiosities of the college museum, where it would be an object of scientific interest, but she said that as it had been with her for so many years she would not part with it, but she gave Professor Garretson permission to keep it for a few days in order that he might take an impression of it and make a plaster of Paris counterpart.

The professor was an early riser and often took long morning walks and upon one occasion his steps led him in the direction of the chalk pits outside of the city limits of Philadelphia, and, on

looking around, he found a piece of limestone which was almost of the exact shape, size and color of the calculus. He placed it in his pocket with the other and finished his story somewhat as follows:

"When the lady came to get the calculus I put my hand in my pocket to get it and I gave it to her, as I thought, but after she had departed, in looking into my pocket, I discovered that I had made a mistake and given her the wrong one, and so I am able to exhibit it to you."

In my own practice I have seen cases in which the only portion of the teeth visible was the cutting edge, the remainder being entirely covered with the deposit of salivary calculus.—*Pacific Dental Gazette.*

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THE ECONOMIES OF DENTAL PRACTICE. By Louis Jack, D.D.S., Philadelphia, Pa. To the term economics I incline to a broader definition than the frugal conduct of one's material interests, and extend its meaning to include also the greater consideration of careful and wise management concerning the broader interests of our function, to secure the best results attainable with reference to the use of labor, time and opportunity as may be possible to each one in his station.

I have been impelled to make this presentation, because in our principal cities it has been a frequent occurrence to leading dentists, who have had the enjoyment of liberal patronage at generous fees, that few of them have laid by more than a small modicum of their earnings. In too many of notable cases their last days have been hard and bordering upon poverty. In this city in over fifty years, of those who had no interests outside of their practice, who have passed out of this life, with only one exception, so far as I am aware, all have died poor and left little or nothing for the support of those depending upon them. This indicates an unfortunate and sad state of affairs. These so unfortunate, either by mismanagement, failure to take advantage of their opportunities, or by lack of frugality, had reached the period of decline of practice in an indifferent condition to meet this state of their affairs, and from necessity had continued working to the end of their days without ability to consider retirement, and the enjoyment of their latter days in comfort.

To secure a satisfactory practice in one art some comprehensive

course should be pursued. Every enterprise has its general guiding plans, which in their application lead to a successful issue. It can scarcely be different with the practice of dentistry.

The novitiate, after his school work is over, comes before the public in a state of uncertainty and anxiety as to the future outcome of his venture in a field new to him.

It is assumed he has had thorough training in the science and art of his chosen vocation. That he is endowed with a natural aptitude for this pursuit, that he has a high degree of intelligence, possesses moral rectitude, courtesy of manner and personal neatness, and with all has deep sympathy with injury and suffering; without these qualifications of character the career of any one in our profession is seriously problematical. They are essential in each stage of life, as well in the dreaded waiting period as in the full flood of success. These stages may be defined as the probationary period, the term of full and profitable practice, and the period of decline, when, from increasing years, the physical forces have become impaired. It is needless to dwell much on this first period of the beginner, as, unless the fortunate condition of possession of means of support or a wide circle of favoring friends, the battle is usually a serious one, but, with courage, patience, study and faithful work in a prosperous community, the ultimate result should not be uncertain of reward. This period is an important and useful one if rightly used in storing the mind with facts bearing upon practice, and in training the hands to establish proficiency.

The thorough performance of work and the filling of all available time, even of working gratuitously for whomsoever will allow it, will lead to the upward path. This effort cultivates ability, develops character and self-reliance, and gives the opportunity to direct the attention of the public to his efforts. When by the force of natural qualities, continued effort, with evidence of ability he has impressed the community about him to give assurance of stability, he at length reaches a condition of full employment, and is then entitled to the reward which attends upon recognized ability. To the credit of American people, they are quick to acknowledge efficiency and encourage skill.

We have now to consider the conditions that accompany the second stage of practice, the one of full employment. When this period is fortunately reached—definite means become necessary to

foster this situation and to control the overpressure, as well as to take full advantage of the opportunity. One may attain an overfull practice and not realize it. He may have his vital force overtaxed in the endeavor to maintain efficiency and to protect from loss by the overpressure. The tendency is to overwork in order to keep abreast of the demand, with the inevitable result of the impairment of the quality of the work and of reduced health by the effort thus required.

At this stage one may, as it were, be strangled by the overpressure of patronage. It is not expedient to endeavor to keep abreast of the pressure by longer hours of labor, as in a short period what is apparently gained by this is soon lost by lessened capacity and reduced vitality.

One of my associates in his early years of practice believed he could do any amount of work and maintain unlimited hours. My reply was, wait until you are fully employed when your limitations will be found. When this period came to him, it was shown he could not keep at his chair as long as I, who was nine years older than he. This lesson I had previously learned and had twice broken down in the attempt to keep up with the demand.

This condition brought me to realize the limitations of one's power and to adopt means to maintain constant efficiency.

These means led to the adoption of the rules formulated and published in an article on the Management of Dental Practice. See the *International Dental Journal*, Vol. XIII, page 81 *et sequa*, and in the proceedings of the Odontological Society of New York for 1891. Here will be found more details than can be herewith incorporated.

The system adopted for the alleviation of the condition alluded to was as follows:

- a—The arrangement of fixed hours for labor.
- b—The avoidance of interruptions by refusing to receive calls or have consultations or examinations except at a specified hour for these purposes.
- c—The distribution of appointments as evenly as possible throughout the working months of the year.
- d—This involved the orderly arrangement of engagements for the care of the teeth of patients, by which this distribution of time was effected and thereby to limit as far as possible the occurrence of severe and protracted operations. That meant

to require a renewal of service at a future and definite period for re-examination, with the result that all patients so far as they would accept this arrangement were under continual engagement. Soon this became nearly universal and proved mutually agreeable and advantageous to both parties. The important effect of this arrangement is that it produces a common interest between the patient and the adviser. They are coöperating for a common good. On the part of the patient it tends to the safety of the organs under care. On the part of the operator it conduces to less tension and establishes a nearly permanent relation between the two parties.

*e*—And the employment of a secretary to carry out these arrangements, as well as to assist in various ways in facilitating operative procedures.

This plan enabled me to carry on an overfull practice for over 40 years, with the result of the maintenance of health and efficiency during this period.

These general statements are all directly economic in their character.

I am disposed to place emphasis upon the question of sustained personal efficiency, which is inseparably connected with the state of one's health, which is determined very much by the effect of the peculiar strain upon vitality occasioned by the character of our work, which can only be avoided by limitation of hours spent at the chair. It is evident that one must be in good condition for efficient work every day, and every hour of each day.

The domestic environment in this connection also is of importance. To me it appears almost absolutely necessary that the home of dentists should be separate from the office, and preferably be in the open country, or in a neighboring village.

There one may receive the refreshment of purer air and the avoidance of noises which in the cities are inimical to profound sleep, so necessary for the removal of the wire edge of ruffled nerves.

With modest country living, daily active exercise, sound sleep and short hours, it is possible to work ten months of the year, and keep in sound condition until the gong of seventy years begins to disturb one's composure.

I have said nothing concerning the reward of increasing income

which naturally should attend the period of full practice. How this may be secured, and how regulated, is an important question. No one having a just moral tone will be satisfied with making the acquirement of money his principal aim and incentive in life. This motive verges upon avarice and leads to sordidness. All honorable persons avoid this motive, but it is undeniable that recognized skill is entitled to reap the material results of ability, and this in a manner somewhat proportioned to the demand for the service, whatever it may be. This is particularly acceded to in the professions. In medicine and in the law and in other similar functions it is so. Should not the same benefit accrue to those practising our profession?

Granting this principle, how is this to be brought about? The public really have to settle the matter for us, but we have it in our power to induce the people to meet whatever legitimate requirements may be made upon them. This may be induced by establishing a correct appreciation of the value of the dental organs, and the importance of preserving them. Our painstaking conscientious labors in restoring the teeth and in protecting them from disease tend to increase estimation of the value of our services. When those who come under our care learn to know the great benefits derived by our conservative efforts, they become prepared to accord a legitimate return for the service rendered. Since it is impossible to place a monetary value upon the teeth, it is in proportion to the appreciation of their inestimable importance that the public will adequately reward us. We have it on our own part by instruction, advice and faithful service to control the question of liberal recompense. Once a father complained of the expense attending the restoration of his daughter's teeth. The rejoinder was, any one of them is worth far more than could be accounted for service to all of them for the whole of her life. This completely settled that case.

How may increase of income be secured? Shall it be by making the fee larger for those most capable, the wealthy, or shall it be an immediate elevation of the rate for all under one's care? If the former plan be pursued we are met by two questions, one is, that the motive verges upon avarice, and is not on just principles, as we have no certain means of determining ability in this matter without being intrusive. On the other hand persons of reputed wealth

are extremely sensitive in this respect, and are liable to consider when they become aware of this treatment, that they have been imposed upon. Often such persons are more careful of monetary affairs than others, as their wealth frequently is the result of careful husbandry. If one follows this method of filling his purse, he may lose the subjects as well as their influence.

When one has an equitable method of accounting, how may he reap an increasing reward? Must it not come by enlarging demand and be in proportion to the demand? In commercial affairs there is a solution of this matter. It may be said to settle itself by a common maxim. With us there can be no quick method. Here the supply of service by each of us is very limited. The cardinal principle may be laid down that when demand upon us for service becomes so great that efficiency is endangered and reduced income is threatened as the result of overpressure, it follows that the demand must be checked. At the same time the hours of labor should not be increased to the detriment of physical health.

The only legitimate method I consider applicable to this condition is a definite substantial increase of fees to new patients by direct announcement of the fact. This puts a check upon the overpressure. Notwithstanding this increase when a sufficient number accept these terms and continue to hold fast, the next result is to equalize to all. This plan simply amounts to bidding up the compensation. The same process may be repeated over and over again, if it is sustained by increasing demand.

This method of increasing the fee had been pursued four times, in each case with a substantial advance; it may cause some surprise that this plan was not a shock to the clientele. The result was to the contrary. During this period of elevation I had at different times three associates, who took over many cases of children and others who willingly accepted their services. These associates laid assured foundations of individual practice. They were relieved of onerous expenses and enjoyed other important advantages. This personal experience is related in illustration of the subject. I fail to believe that any difficulty should arise to those who, when the conditions warrant, choose to pursue a similar course, subject to whatever modifications the peculiarity of their situation might require.

Any one confidently situated and courageous may proceed in this

manner. Human nature is the same everywhere, as people appear to want what is difficult of procurement, particularly when their tastes or appreciation inclines them. With respect of notification of increase of fees to new patients, this was announced upon engraved cards, which were not distributed—one was placed in a conspicuous place in the waiting room. Others are left with the secretary to use at her discretion, as a reply to a relevant question. Discerning persons see at once the value of such an announcement, and have leisure to consider what they may do when equalization takes place, as whether to remain, to withdraw, or to accept the services of an associate.

When indications give assurance for equalization, this may be announced in the same manner.

In this connection it is to be observed that persons who have a correct estimate of the importance of preserving the teeth and the related parts in health will make sacrifices to secure this end.

Concerning this whole matter, it is necessary to be open-minded, direct and uniform.

Concerning the basis of fees for operative services, the question arises as to the elements which should regulate the compensation. Should it be specific? Should it be proportioned to the skill required with the attendant strain? Should the principal element be the time expended, or should it be for a somewhat hypothetical hour's service?

Where specific, when the matter is of the simplest character, such as a prophylactic treatment or small occlusal cases, the questions of skill and extended time do not enter into the equation. According to the old method of uniform charges, it would appear unjust to debit the patient for the matter of a few minutes the same as one for an hour or more, a practice common some years since, and still prevalent in Europe, which tends to the avoidance of extensive operations in the best manner. Formerly these small cases were considered compensatory for the time required for more difficult operations. This appears unfair to those who take excellent care of their mouths and have simple disorders to be treated, and favors those who present difficult and larger cases. A fairer method is one based on time expended in which the necessary skill is proportioned to the time employed. This method should be qualified by the operator's condition. Any facile and methodical operator can

fairly estimate what constitutes an hour's service. At times where his ability is lessened by some physical disability his compensation is diminished according to what he may have accomplished in any given time. This makes the consideration fee for an hour's service in comparison with an hour's time. If, however, the diminution of service be caused by the peculiarities of the patient's physical condition or otherwise, the time limit should be the standard and not the amount of service accomplished. Every fair man will have little difficulty in arriving at a just compensation for his effort, whether the patient be a good subject or an indifferent one.

We come at this point to an aggravating question as to losses of time caused by the lapse of appointments. Should a debit be made when loss occurs by non-fulfillment?

If one will estimate the cost to him of each of the limited number of hours he can safely be employed, he will learn how serious this loss is. Items entering into what is called rent, materials, instruments and incidentals of practice, and will add to these the domestic expenses of his family, the aggregate for the year has then to be divided by the number of hours assigned to ten months. If he is a frugal person and saves of his gross income one-third he will have to lose the profit of two hours to pay for the cost of the lost hour; thus the savings of three hours have been sacrificed.

It thus appears that the least charge for a lost hour is the cost of that hour, which thus reduces the apparent loss to the profit of one hour, but a just compensation for lost time by the fault of the patient should be the initial fee for an hour's service.

In this calculation one must deduct from the assigned number of yearly hours at least ten per cent for various matters from which no income can be derived, such as renewals by the operator's fault, gratuitous service, personal disability and other losses of time from unavoidable causes. It, therefore, is just to hold our patients responsible for their deficiencies when the practice reaches the degree where the loss is actual.

Not until the past fifteen years have sudden breaking of appointments been common. They pertain to women and children who in recent years have so many diversified engagements.

I have said nothing concerning the necessity of those in full practice keeping close oversight of their affairs, in other words observing the necessary degree of frugality to prepare for the

period when their efficiency becomes lessened. As a class those who engage to practice dentistry have little of what is called business instinct. Few men naturally so endowed would be led to the practice of our profession. They are, therefore, liable to be careless and to pay too little attention to their future. This probably is more so with those who on the surface appear to be very prosperous and become too indulgent, not seeing the breakers ahead, and therefore fail of frugal foresight for an inevitable future.

What shall be said of those whom the advance of years, lessening skill and diminishing opportunities coming upon them find unprepared to lay down their work? Without agreeing fully with Dr. Osler that the capacity of the average man reaches its climax at fifty, it is certain that some evidence of waning power appears to most men at from sixty to sixty-five, when the hand begins to lessen in its facility and precision, and some diminution of vision, however slight, is observed. Those who are not inclined to take their names off the roll should then prepare for making their latter years useful by cultivating practice in prosthesis and orthodontia, in either or both of which one of capacity for these branches may carry on a work of usefulness and satisfaction until the frosts of life's winter appear on their faces.

Heredofore my paper has been related in its economic features to the operative branch of our work. My own experience for nearly fifty years has been almost exclusively confined to treatment of the natural teeth. Prosthetic treatment does not appear to accord with overplus of operative service, even when opportunity has occurred in some leisure periods to engage with such cases. The result has not in my experience proven satisfying.

In this department of our work there has not been established a satisfactory system, simple cases and difficult ones being treated too much alike. It does not appear that the compensation generally secured is adequate to procure the best of workmanship, or to leave a sufficient profit. My plan, to be on the safe side in this respect, has been to debit the cases with each office service the same as for the time expended in operative procedure. To these several debits is added in gold or "continuous gum cases" double the cost of materials and the laboratory charges. Fifty years ago, and for many years after, full gold cases had a common charge of \$100, whereas to have the best service of this kind secured with the proper

artistic care the compensation is not adequate on a lower basis than as stated, which nearly or quite trebles the above rate.

It may with propriety be held that the prosthetic department is in need of advancement of quality in respect of the artistic relations as well as the laboratory execution. Preference should be given to those most capable of executing the mechanical part and avoidance of cheap and inferior workmanship.

It follows from the undercurrent of thought within this discourse that the practice of dentistry is not satisfying unless one has unusual opportunities combined with natural adaptability for practice. That in the second period of real success one must be prudent of management, enterprising in action and frugal in relation to expenditures. That in the period of declining practice one should prepare for retirement as soon as efficiency begins to decline, and to arrange as he may be able to enjoy his remaining years in comfort, and to find agreeable occupation and congenial recreation, to smooth the last days whilst he remains in this life, that it may be said of him that he hath done well with all the opportunities which under Divine Providence have fallen in his pathway.

*DISCUSSION.*—*Dr. Edwin T. Darby*, Philadelphia. I think Dr. Jack will be assured by the enthusiastic reception of his paper that it has been appreciated. I am confident that I voice the sentiment of everyone present when I say we are indebted to Dr. Jack for his most valuable paper. In years past Dr. Jack has written and spoken upon this subject, perhaps not in precisely the same way, and I feel that I have been indebted to him ever since I came to Philadelphia for some very valuable ideas in regard to methods of conducting a practice. While, perhaps, my method has varied a little from his, it has approximated it so closely that I think I may say it is very similar.

He has touched upon subjects that are of vital interest to the dental practitioner. At the very outset he made allusion to the fact that only two men who had practiced dentistry in the city of Philadelphia within a period of fifty years had accumulated a competency unless they had other resources and died leaving their families well provided for. That seems a sad commentary upon the business ability of dentists. I presume the history of lawyers and physicians is much the same. It has been my observation that this same condition of things has existed also in other cities. In New York City

many of the old practitioners, who were in full practice and thoroughly established with large incomes, have died poor, and I think in every city in this country a similar history would be recorded of those who have at one time had what might be considered a large and lucrative practice.

Just where the fault is Dr. Jack has in a measure pointed out. In the first place he has said that dentists are not good business men. They have not had business training nor the business instincts which men trained in business life have. At the same time the dentist (I single out the dentist because I am more familiar with his methods) does not take into consideration that he is able to work only a certain number of hours per day and to work efficiently only about ten months each year. I recall what a lawyer once said to me: That he could support his family very well if he worked but ten months of the year, but not if he tried to work twelve. The average man does not provide for sufficient recreation. Neither does he provide for the incapacity which every man has a certain part of the year.

Dr. Jack has most succinctly and definitely put before us the value of each hour. A broken appointment is an hour lost. If the hour is valued at \$10.00, it is ten dollars out of his income. If this occurs often you see how great a loss it is to the man working three hundred days in the year. Just in proportion as he works hours, in such proportion will his income be. Just in proportion as he loses hours, in that proportion is his income cut down.

I am sometimes asked why dentists do not save money. I cannot say that it is because they make their money easily and spend it freely, because I think no class of men work harder than the dentists. I suppose it is the want of business training and not realizing that the "rainy day" is coming, that old age is creeping on slowly and that they will need any more in the future than they need for the present. They spend their money, I will not say recklessly, but perhaps extravagantly, just because they think they will get more money the next day.

Early in my professional life I heard a story of Benjamin F. Butler which has been valuable to me. He began the practice of law in Lowell, Massachusetts. Directly under his office was a bank and the president of the bank was a nice genial man and had taken quite an interest in Mr. Butler as a young lawyer. He said to him one

day, "You seem to be getting quite a nice practice; may I ask what you do with your money?" Mr. Butler replied that he did not spend it foolishly, but often loaned money to his friends, a good deal of which he never got back. The president said to him, "Will you take a little advice? Buy a little house and have something to pay for, then you cannot loan your money to friends. I will advance the money to make first payment and take a second mortgage, the owner will take the first mortgage. In a little while you will find that you have paid for the house and without feeling cramped in doing so." Mr. Butler took his advice and bought a house. After that was paid for he bought another, and another, and in this way became a large real estate owner, simply putting the money that he could spare into real estate.

I think it is a good thing for a young man to have something to pay for, even if he takes out early in life an endowment insurance policy.

I wish dentists could learn the importance of following some such plan. Dr. Jack's paper is valuable not only to the young men but to some of us older men. I know that his system of conducting his practice is a very consistent one. He has dealt openly and above board with his patients. When he has contemplated an advance in his charges he has notified his patients that the increase would be made. There are usually enough people in every community who are able and willing to pay a man what he thinks his services are worth. It is an unfortunate thing that in Philadelphia dentists are so poorly paid for their services. When I began practice in Philadelphia two dollars was the uniform price for a gold filling. I immediately placed my fee at five dollars and maintained that as the lowest price.

I hope, gentlemen, both you who are young and those a little further advanced, will take to heart the suggestions made by Dr. Jack in regard to the economics of dentistry.

*Dr. James Truman, Philadelphia:* I suppose that my experience will go back, probably, as far as Dr. Jack's, as we both graduated at the same time. I was surprised to hear that there were two men practicing dentistry in Philadelphia who had died rich. I never knew but one. I believe that Dr. Jack with his valuable experience, as he has detailed it, has done more for the advancement of dentists in the direction of good business than probably any other man in

this city. If I had only been equally as good when I was young, as he has proven to be, I would have a little more to live on in old age.

I do think, however, that the average dentist fails, not only in a business sense, but in a healthful sense. There are so many dentists who will work from early morning until late in the evening, and sometimes into the night, after the office hours of the day, giving the time then to prosthetic dentistry, burning the candle at both ends, and thus eventually fail in health and finances. It has been my sad experience to know of a good many such cases, not only of failure in making money, but of broken health. I was struck with this two or three weeks ago upon meeting a gentleman whom I had not seen for many years. He referred to the advice that I had given him some years ago that if he continued to practice dentistry, as he was then doing, he would break down in health. The break did come and forced a change of residence to California, but he is now engaged in another line of work. I have in mind one man who appreciated the value of health, Dr. Jenkins, of Dresden, vigorous in body and mind. It was my good fortune to be with him for several months. He would not begin work in the morning until nine o'clock, although pressed with practice. Prior to that time you would find him out in the environs of Dresden. When five o'clock came in the afternoon you would hear his voice calling for us to go out for another hour's tramp. This has been my practice. I would not sacrifice health to the mere dollars and cents, but would take recreation as it seemed to be required, and while perhaps money may not have come to me as it has to some others, yet I have had my share of "the good things of life" and have reached an age when with unabated vigor I can talk and work with the same energy as I could way back in the fifties.

I think we all agree that one of the things the young dentist most needs today is business qualification. One of the most valuable aids to me was the time spent when a young man in a business house. I am very glad that Dr. Jack has put these facts so plainly before the Academy and I hope that his paper will be widely read. Every dentist should understand that his practice should be managed according to certain rules, and that if it is not thus carefully managed there will surely be a loss. We all know of men in our city who at one time had large practices, but failed utterly through lack

of business ability. These eventually either passed into homes or died leaving those dependent upon them without proper support. I know of no better rule to guard against this than that suggested by Dr. Jack of regarding the value of every hour.

*Dr. William H. Trueman, Philadelphia:* How to manage and regulate one's business is matter to be considered from a personal standpoint. We do not all begin life alike, nor are our circumstances and surroundings the same. The suggestions thrown out by Dr. Jack are worthy of your earnest and most thoughtful consideration, coming as they do from one who has had so eminent and so successful a professional career. He has well said every vocation properly conducted should furnish those who follow it a fair maintenance during the active years and enough over to ensure comfort during the autumn of life. Observation confirmed by biographical reading has impressed me that to be considered fairly successful one should, during thirty years of business life, have laid by sufficient that the interest therefrom will furnish a comfortable living to the worker and the workers dependents—barring, of course, serious illness and dire misfortune. To accomplish this it is necessary to save something every year; a little when the income is small, and more as it increases, as it should for some years at least, if properly managed. And now an important point. When you have saved, put it where it will be safe. Don't be selfish, be generous, let the "other fellow" have all the sure ten per cent. investments, and a monopoly of the many alluring schemes to double one's money in a year or two. He may not appreciate it later on—but never mind—unselfishness brings its own reward, don't worry over him.

Another point Dr. Jack has touched, it cannot be emphasized too strongly. A dentist must keep in good trim. Good work is not expected from poor tools. Imprudent living or overwork is suicide to a professional man. By system, by tact, by management, make good use of all your time, and make the most of your practice, be just to yourself and to your patients. Dr. Jack has suggested how to do this; his methods may not suit all, but his injunction to work systematically is universal in its application.

It is well to remember that life is short, to a dentist. A dentist reaches his "top notch" at fifty. If he has not then a paying practice, he never will have; if he has then saved nothing, his harvest

is passed. After fifty comes the short slope. It is then working along comfortably until the resting time, or labor and worry until the end.

Dividing the time between working and rest is a personal equation each must work out for one's self. Long and serious illness brought me face to face with it early in my professional career. For over thirty years I have worked five days a week, and nine months a year, and am confident that it has resulted in less illness and more accomplished. A short rest, away from home, spring and fall, and a long one in summer, sets one up for "hard at it" during working time.

This careful business management Dr Jack has so earnestly presented is all, however, a personal equation, a question of saving; saving time prudently and judiciously; saving strength and health systematically; saving from earnings, and saving by putting them in a safe place.

*Dr. Joseph Head, Philadelphia:* A special point of interest to me in Dr. Jack's valuable paper is his mention of the hour service, that it was not always sixty minutes that he charged for, but the hour value. This means that you can give an hour's service in fifteen minutes perhaps. Often when one has been in particularly good trim he may have been able to put in three porcelain fillings in one hour. It would be ridiculous to charge for such service upon the basis of filling a tooth at a standard price.

As Dr. Jack has said, we alone can place a value upon our services. We should follow his dictum, remembering that as we value those services so will our patients value them. By a just appreciation of our services we do good, not only to the entire profession, but to the moral sense of the community at large.

*Dr. Jack (in closing):* I have some matters not included in my address which were not clearly in place. There are two matters somewhat related to personal aptitude which bear upon one's interests. One is in regard to the degree of suffering necessary to impose upon the patient in the preparation of cavities. With our knowledge of means to relieve sensitivity it is evident one who does not give required relief may jeopardize his interests. While so-called painless dentistry is a sham, unvarying sympathy expressed in affording needed relief is a humane obligation. Besides this consideration mutual comfort is secured and time is saved.

Another point is with reference to the touch of the dentist. You will find patients speak of such a one as having a fine touch. The degree of force expressed by each hand should be gentle as to the left one. As to the right, the force should be graded according to the need, from the lightest contact to the fullest force required at the point of the instrument, without disturbing the easy pressure of the other hand.

It may be of some interest here to present the calculation of the hours of a dental practice of ten months, five and a half hours each day being spent in ordinary operations and one hour making examinations, short consultations and other trivial attentions. This hour having uncertain value is left out of the calculation, whatever income derived from it going to the good. Two hundred and sixty days of  $5\frac{1}{2}$  hours equal 1,430 hours; deducting 10 per cent for personal deficiencies and unavoidable losses of time, etc., there remains about 1,300 hours. If the time should yield an average of \$5, the gross income would be \$6,500. If the rate be \$10 per hour, the income would be \$13,000. This result I believe to be above average realization.

It may be advised that in the establishment of practice when the income from operative services reaches the sum of \$6,000 per year with all the above allotted hours filled, the period has arrived for that person to advance the initial rate for service, and to keep on doing so as far and as often as the indications make it safe.

Connected immediately with this consideration is the calculation of the probable number of regular patients who have accepted the outlined arrangement to have regular periodical examinations and service.

In the allotment to fill the 1,300 yearly hours, sixty-five examinations and 130 hours are engaged for each month. This rate gives six hundred and fifty examinations in ten months. Allowing each one to be examined twice makes the result that, if the average of four hours' service be realized for each one per year, 325 patients will fill all the time. When this number of persons agree to accept this plan, one's practice is placed on a solid basis and an assured income is certain.

The occurrence of withdrawal of patients and of their decease is made up by the natural increased demand. If this were not

so, many of us would be out at elbows in a few years.

Here no account is made of patients who while on the list have preferred to make their own arrangements for service and who appear irregularly.

When it is considered that less than 400 assured patients are sufficient for a full practice, and as this number represents the equivalent of 100 families, ten operators satisfy 4,000 people and fifty 20,000 people. Surely there are in a city like this more than that number capable of giving liberal compensation.

It may be stated in any case if ten men in good and full practice require abundant reward, standing shoulder to shoulder in supporting each other—their course tends to elevate the fees of all their capable associates—even one person who goes forward in a firm and rational manner lifts the prospects of all his fellows.

—*Dental Brief.*

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OPEN WINDOWS AND ADENOIDS. By J. Sim Wallace, M.D., D.Sc., L.D.S., London, Eng. The simplest, most definite and most important truth which preventive medicine has been teaching during the last few decades has been the value of fresh air. This fact has justified many a monograph dealing with the genial amelioration in health which has resulted. Curiously enough, the historical or evolutionary justification of the doctrine has not received the attention that such an important principle demands. I do not intend to attempt to supply this want; at the same time I must allude to it, for it was, paradoxical as it may seem, the consideration of this subject which led me to believe that we are not justified under all circumstances in advocating fresh air without any reserve. Moreover, a consideration of the evolutionary justification gives also a rough guide to the limitations or rather safeguards which have to be observed under special circumstances. If we look back at the evolution of man we see that he is undoubtedly and essentially a fresh air animal. Our relations, the monkeys and the anthropoid apes, are animals which specially indicate an urgent need for fresh air if they are to be kept in perfect health. Their arboreal habitat has from all time fitted them for fresh air, and when brought to confinement, as in zoologic gardens, the absolute necessity for thorough venti-

lation in their houses is now recognized. Moreover, like ourselves, the monkey tribe is specially susceptible to succumb to certain diseases which are almost innocuous to such animals as rats and mice, which may be taken as types of animals not requiring perfect ventilation to keep them in good health. There appears to be one thing, however, in which we differ from our anthropoid relations in respect to habitat. Man is not solely a tropical or sub-tropical animal. To him almost all regions of the globe are habitable, while anthropoid apes, at least, seem quite incapable of living for any time, even in temperate regions, except when most carefully protected from the inclemency of the weather. So, too, perhaps, it was with man before he became more highly differentiated from these animals, until, indeed, his intelligence, his clothing and housing such as it originally was allowed him gradually to live in countries less and less tropical. And although at the present day men are adapted to live in northern climates, yet the essential similarity to our anthropoid ancestors is still to be seen in a heavy mortality from the very disease to which monkeys are susceptible when they are brought to live in these climates. It does not need any argument, indeed, to show that man without house and clothing is not fully adapted for all the climates in which he lives. This applies even more strongly in the case of infants and children who are unable to stand exposure so well as adults. We are certainly justified in saying that ever since man commenced to depart from his tropical habitat he must always have had some protection, especially for his children, against the less congenial climates. In other words, a house and clothing become necessities of life. At present I intend to refer only to the house. It was until recently a primitive protection, perhaps, but it had this merit, it was always, with the help of the other primitive comforts, obtainable enough to allow for the continuity of the race. It may have had its faults, it may have been insanitary, it may have been ill-ventilated, especially among cave-dwellers, but on the whole its utility justified its existence. Probably many millions have perished on account of the faults of hygiene referred to, and perhaps during the same period man may have become better adapted to his climatic surroundings, although infants and children, which were

necessarily kept more strictly under the protection of the house, may not have become so fully adapted.

What is of special importance to note, however, is that the house existed as a protection against certain extremes or kinds of climatic conditions which are inimical to the well-being of the human body. It may here be said that these kinds of climatic conditions to which I refer do not exist in tropical or sub-tropical regions, so that we, as animals, had not in our primitive state become adapted to these climatic conditions. It would appear that cold and damp are in general never associated in the tropics; in many tropical localities where the atmosphere is clear, dry and still at night, radiation is rapid and very considerable cold may be experienced, but during rainy and damp weather the temperature does not fall to anything like the same extent. When we consider cold and damp, however, such as, let us say, are exemplified in our climate from November till March, we begin to see something different from tropical climatic variations and are justified in doubting if man is altogether adapted for them.

Now let us consider what habit and instinct appear to show. It is hardly necessary to refer to the fact that fires are universally used in cold weather, and this in spite of the fact that it is a more expensive method of maintaining heat than by shutting out the air and heaping on clothes. Now the fire has three attributes to which I would refer: Firstly, it provides warmth; secondly, it ventilates; thirdly, it reduces the humidity of the air. Thus fires are beneficial from all these three points of view. It has not required the advances of science to induce people to put on fires. They instinctively do so. The advances of science have, however, been necessary to induce people to appreciate as thoroughly as they should the benefits of fresh air. But the fresh air doctrine has during the last thirty years been taught with effect, and among the educated classes there are few who do not appreciate it. In fact, it seems to have become a sort of cult, and notwithstanding the fact that there is an instinctive tendency to shut windows on cold and damp nights, the doctrine of fresh air winter and summer has now become part of the educated man's faith. But here is where a protest must be made. Not because of the insistence on fresh air winter and summer and

night and day, but because of the method most commonly employed to secure it. The neglect to prevent the cold and damp from accompanying the fresh air must be regarded as a serious error. In other words, it is not right to attempt to ventilate a room by simply keeping the windows open if the weather is cold and damp. There are several diseases which the medical profession recognizes to be in some way associated with cold and damp, such as catarrhs and rheumatism, but I only wish to refer to one at present, namely, "adenoids." This disease has apparently increased in frequency with prodigious rapidity in recent years, and what is certainly very suggestive, its increase seems to have been concomitant with the cult of open windows night and day, summer and winter. Moreover, my observations would appear to indicate that the proportion of children affected with adenoids is distinctly greater among the more educated classes who are most scrupulously insistent on keeping their windows open at night throughout the year. Children brought up with open windows appear, indeed, to be about fifteen times more likely to contract adenoids than those who sleep with the windows shut on cold and damp nights, or at least than those who sleep with closed windows throughout the greater part of the year. The few figures which I have so far been able to obtain are as follows: Of 69 who slept with closed windows two cases of adenoids were found, while of 49 who slept with open windows at night, winter and summer, 22 cases of adenoids were found. *It will be seen from the above that adenoids appear to be confined almost entirely to those children who sleep with open windows*, but notwithstanding this, it must not be thought that there are no other contributory causes, or that I abandon altogether the other factors connected with clothing, perspiration, digestion and the development of the palatal arch which I have previously referred to elsewhere. It would probably be more satisfactory, therefore, if in the collection of further statistics the relative frequency of adenoids was considered class for class and not one class against another where the other conditions, such as housing, fires, clothing, etc., may be essentially different.

When we consider the question from the point of view of physiology and pathology and what is already known with regard to the etiology of adenoids, we find that we must arrive at the

same conclusion. The first point we have to note is that cold air, especially when damp, causes a certain amount of congestion and catarrh of the mucous membrane of the nose and nasopharynx. And although it may be foggy and on that account specially objectionable to breathe the air directly into the lungs, we tend more than usually to breathe through the mouth. If the stream of cold air is made greater, as for example during considerable muscular exertion, then the congestion and simple catarrh is augmented. Those who skate need hardly be reminded of this. Now if it is conceded that cold and damp air induce congestion and catarrh, then if continued sufficiently long it will tend to produce thickening or hypertrophy also. But in addition to this it seems undeniable that the specific catarrhal inflammations are more readily contracted when the mucous membrane is congested from irritation by cold and damp air and therefore tend to increase the hypertrophy.

Referring to acute catarrhal pharyngitis, De Schweinitz and Randal say: "Exposure to cold really means lessened resistance of the tissue to germ vitality and germ entrance into the substance of the membrane." And referring to acute nasopharyngitis, they say: "Exposure to cold and damp plays the chief exciting rôle. Here also should be borne in mind what has already been said regarding such exposure as related to temporary impairment of tissue vitality. As occurring in very young patients, we generally find acute nasopharyngitis associated with more or less enlargement of the pharyngeal tonsil, which in turn may have resulted from repeated attacks of acute rhinitis."

Whether the above considerations are considered valid or not, it is a fact that cold and damp localities are usually recognized as at least a predisposing cause of adenoids, and if the above explanation is correct, then instead of cold and damp localities rendering the individual susceptible to adenoids in some vague constitutional way, we see that cold and damp localities cause adenoids from the simple fact that the cold and damp air is the primary exciting cause itself.

Next when we consider heredity we read for example in Mr. McLeod Yearsley's book on Adenoids that "although it cannot be positively said to be hereditary, hypertrophy of the pharyngeal tonsil often shows a distinct tendency to affect several mem-

bers of the same family." This is a significant fact and indicates in my opinion that the malenvironments of certain families tend to produce the disease in each member of the family. If, then, "it is by no means an uncommon experience for the surgeon to have to operate upon two, three, or even four or more in the same family for adenoids," and since "this fact has been referred to by nearly every writer of any consequence upon the subject," then it surely is evident that there must be a something in the nature of a very definite and direct cause of adenoids in some families and that this definite and direct cause is cold and damp night air seems probable. If we consider treatment a similar conclusion is enforced. Surgical treatment is recognized as being very satisfactory, although recurrence sometimes happens, but medical treatment—notwithstanding the tendency for the hypertrophied tissue to shrink—seems to be attended with very unsatisfactory results. If medical treatment does not recognize the cause and if such directions are given as "especially should it be insisted upon that the child shall sleep in a room directly open to the outside," then in a climate such as ours in winter, medical treatment will probably be unsatisfactory.

It was a consideration of several of the above facts that led me to doubt the advisability of open windows at night in cold and damp weather, and it did not surprise me to find that a direct investigation into the relation between open windows at night and adenoids resulted in the figures which I have already given. Although the relationship seems to be unquestionable, yet having regard for the other conditions and predisposing causes I am of the opinion that a more extended investigation will not reveal such a startlingly close relationship, especially in those localities which are (unlike the Thames Valley, to which my figures specially refer), relatively free from cold and damp night air.—*Dental Record.*

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PROLONGED NITROUS OXID AND OXYGEN ANESTHESIA FOR DENTAL OPERATIONS. By H. Bellamy Gardner, M.R.C.S., L.R.C.P., London, England. In a paper which I contributed to the transactions of the Odontological Society of Great Britain in January, 1907, I described the apparatus and method by which nitrous oxid with variable percentages of

oxygen may be continuously administered by means of a combination of Mr. H. I. Paterson's nosepiece, Dr. Hewitt's mixing chamber, and Dr. A. G. Levy's double gas bag with a specially designed removable valve chimney made for me by Messrs. G. Barth & Co.

The object of the present paper is to report upon a further extensive use of this method for dental operations which require anesthesia of more than one minute's duration. Experience shows that a great increase both in the precision and comfort of the dental surgeon's work is attained by the absence of the need for haste in its performance.

It is so frequently impossible to foretell what difficulties may arise during the extraction of teeth that, with this prolonged method at his disposal, the administrator feels daily more inclined to use it in all but the very simplest cases, not only for the benefit of the operator, but for the credit of general anesthesia with the public. By the ordinary method of administration he has only a very poor resource in giving a second dose of the gases because the duration of unconsciousness so produced is even shorter and generally less tranquil than that of the first dose. Even when one tooth only is to be extracted it may be already broken off or so badly decayed that it is certain to break off during the operation, leaving its two or three roots embedded in their sockets below the alveolar margins; it may be impacted beneath the ramus of the jaw, or between its fellows; sponging blood away is often necessary to locate remaining roots when some have been withdrawn, and, in addition to these difficulties, the time taken in the extraction of teeth may be prolonged by the presence of exostoses, curved roots or abnormal density of the alveolar process. Whenever the dental surgeon has a foreknowledge or presentiment of difficulty in the extraction it seems right that this method should be employed so that any length of complete anesthesia may be kept up from two to five or six minutes if needed, so that it may be scientifically dealt with.

For cases requiring devitalization of one or more teeth no system could be more perfect, because after a certain amount of drilling has been carried out the painful extraction of the pulp has to be done toward the end of the anesthesia when induced by the ordinary method. By the method now suggested there is no difference in the depth of anesthesia until the pulp extraction

has been completed and the nosepiece is removed, so that the possibility of pain being felt is out of the question. In cases where multiple extractions of some difficulty and situated in various parts of the mouth have to be undertaken, it is possible to work under prolonged nitrous oxid and oxygen by completing the work on the left side of the patient's mouth first, *i. e.*, on the side next to the anesthetist, because he only has his left hand free for inserting the Mason's gag; but ether is a better anesthetic for such cases, for muscular relaxation is more perfect and the administrator can render much greater assistance to the operator in a heavy task.

The applicability of the prolonged method has been extended to the case of powerful men as well as women and children by the construction of a larger size of rubber rim-pad for the nasal cap, which prevents the compression of the alæ nasi, which sometimes occurred with the former rims in such subjects.

After-effects upon the patient are very slight and are certainly no more frequent than those of the single dose; but it should not be forgotten that a certain feeling of malaise is likely to ensue in proportion to the severity of the operation *per se*.

Sickness in children and florid adults is most frequently caused in the course of administration of nitrous oxid and oxygen and immediately afterward by the secretion of a considerable quantity of saliva and mucus from the mouth and tonsils, which irritates the pharynx and starts the act of retching; but this is very rare when the gases are administered by means of the nosepiece.

I have never seen untoward symptoms during the nasal administration of nitrous oxid and oxygen, which, with proper management, induces and maintains anesthesia of a tranquil type, with a natural color, respiration of normal rate and pulse of good volume and regularity.—*British Journal Dental Science.*

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THE ROMANCE OF DENTISTRY. By M. R. Harned, D.D.S., Rockford, Ill. To go into the romance of earliest dentistry, when the itinerant dentist went from house to house and removed offending molars, or pounded out appliances to retain loosened ones, or stuffed holes in teeth, carrying the news of the community, the choice bits of gossip, or the latest song, might in-

deed be interesting, or under a master hand at least entertaining. But it is not the purpose of the author to deal with this phase of the romance. For the romance which appeals to men of this age is the romance of action. And so I would introduce the men and the ideas which have been influential in the formation of the dental profession as it is today.

That dentistry is not strictly modern is shown by the fact that ancient Egyptian records indicate that dentistry was considered a distinct branch of surgery; that among the writing of the Greeks, Hippocrates and Herodotus (about 400 B. C.) dental subjects were casually treated, while the historic records of the Romans by Pliny, Martial, Horace and Celsus contain dental items, and Galen devoted some space to the subject (150 B. C.).

But the dark ages came on and interrupted the making of records; surgery in all its forms fell under the ban of superstition; magic only was allowed to heal; libations were poured, sacrifices made, incantations sung, and we surmise the abscess broke, the gods were appeased.

However, during the first fourteen hundred years of the Christian era various authors incorporated dental items in their records: such were Etius, Phaxes, Albucasis and Eustachius.

Probably the first book published upon the subject was written anonymously by a German (1530), a copy of which is now the property of Dr. Black (to whom I am greatly indebted for much else besides the following information which is contained in Dr. Black's new work not yet from the press). This author refers to one Mesu (who wrote about two hundred years before, but no records remain) as an authority upon dental subjects.

Two items in this book are of particular interest; one is the first mention of the use of gold leaf for filling teeth; the other is with regard to causes of decay.

Translation: "Caries is a disease and evil of the teeth in which they become full of holes and hollow, which most often affects the back teeth, especially so when they are not cleaned of clinging particles of food, which decompose, producing an acid moisture (literally a sharp moisture) which eats them away and destroys them so that finally, with much pain, they rot away little by little."

This author was the first to approach the theory of caries as we

now know it. In fact, he was nearly three centuries ahead of his time in this respect.

In 1579, Pakie (French) wrote a treatise upon the teeth. Fouchard wrote in 1731, but neither of them approached this phase of the subject as did the German. In 1778, John Hunter (English) called caries "mortification" and Fox (1806) and Bell (1825) called it "gangrene."

Dental practice was introduced into the United States in 1778 by Lemaire, a Frenchman who came to this country to join the revolutionary forces.

So much for a brief outline of ancient dental history.

The real romance of dentistry, however, did not begin until the nineteenth century. Men had worked hard and devoted their lives to their patients, but they had not cooperated to help each other. In the early thirties of the nineteenth century they began to see the value of association. This was probably due to the example of the medical profession, and so they conceived the idea of being grafted onto that profession, as a branch of the healing art. Overtures were made, looking to adding chairs to the medical curriculum for the teaching of dentistry. These suggestions were set aside as being unworthy consideration, because dentistry was "simply a mechanical art."

This rebuff seemed to furnish the incentive necessary to such men as Chapin A. Harris, Horace H. Hayden, Thomas E. Bond, H. Willis Baxley and others, to bring dentistry out as a distinct branch of the healing art. They determined to make it worthy the title of a profession, and they have left us an inheritance of which we are not only proud, but an ideal which we love to honor, and a responsibility which we are determined to fulfil.

They accordingly got together, and declaring that "the degree of M.D. does not indicate a qualification to practice dentistry," they applied to the state of Maryland for the first charter for a dental college, under the name of the Baltimore College of Dental Surgery. This was granted, and the college established in 1840. About the same time (1839) was organized the first dental society, in New York City, called "The American Society of Dental Surgeons." And in 1844 the Mississippi Valley Dental Association was formed at Cincinnati. These organizations were followed

by others, and many of them. They sprang up all over the country, and with them, magazines to publish their proceedings and promulgate their ideals. Among these early publications were the *Dental Register* of the West and the *News Letter* at the East.

The tremendous impetus given to the new profession by such a combination of educational forces can well be imagined. Men are always ready to help, when an emergency comes, and so the volunteers were many and enthusiastic, and the true professional spirit was shown by the willingness of each and every one to contribute his mite to the general welfare. And with these facilities for spreading ideas, the profession is like a great phalanx marching elbow to elbow. The touch of a button in New York, Chicago or San Francisco is known throughout the line, and the common sentiment is "We rejoice in our opportunities" and "Push on to fulfillment."

Our progress has been a series of wave motions, and in the truly romantic fashion, every seventh wave is the great one.

What the first ones of the century were is hard to trace because of lack of records, but the first one of great significance recorded, which seemed almost like a tidal wave, was "Mineral Paste," introduced into this country about 1830 by two Frenchmen, Crawcour, under the name of the "Royal Mineral Succedaneum." It consisted of a combination of silver and copper, rendered temporarily plastic by mercury. As soon as it was known that mercury was used, the fight was on, and it has been kept up ever since. In 1841, the American Society of Dental Surgeons appointed a committee to report on filling materials containing mercury. The committee reported "that the use of all such materials was injurious, both to teeth and mouths, and that there was no tooth which could be *serviceably* filled that could not be filled with gold."

Cases of ptyalism were invariably charged to such fillings if any were present. Charges were made and refuted, until 1845, when the Society appointed another committee of investigation. The members of this committee were to call upon each and every member of the Society and ascertain each man's views. After doing so, and discussing the subject freely, the committee made their report and concluded with the following sentence: "That

any member of this Society who shall hereafter refuse to sign a certificate pledging himself not to use any amalgam, and, moreover, protesting against its use, under any circumstances, in dental practice, shall be expelled from this Society." In 1847, eleven members were expelled for using amalgam and refusing to sign the required pledge. The Society struggled on, much hampered, and in 1856 "gave up the ghost." A peculiar fact in this connection was that Dr. Elisha Townsend, the author of the formula for Townsend's amalgam, was president of the Society and issued the call which resulted in the meeting of dissolution.

In 1867, the St. Louis Odontological Society passed the following resolutions:

Resolved, first, That the filling of teeth with amalgam is injurious and detrimental to health.

Resolved, second, That as a society we discountenance the use of amalgam in dental surgery and will not use it.

Resolved, third, That we are always prepared to defend the principles herein laid down and invite discussion thereon.

The war went gaily on. Dr. Townsend retracted all he had said and done for amalgam, and denounced it as unfit for filling teeth. This combination seemed like the death knell to amalgam. You have heard it said that Grant was a failure at thirty-nine and one of the world's greatest generals at forty-one. The emergency showed the man's mettle. So when Dr. Townsend went back on amalgam, it made J. Foster Flagg. For, as he says, "As it was entirely owing to Professor Townsend's faith in the tooth-saving quality of amalgam that I had been induced to commence experimenting with it, it was with peculiarly painful professional feelings that I viewed this retrograde step—as I thought it—in that work which I esteemed a progressive movement."

This act intensified his interest. He redoubled his efforts, and elaborated his experiments. He combined with Dr. S. B. Palmer and organized what was known as "The New Departure," and did better and more scientific work than had previously been done. They gave of their lives in a labor of service and love; they sacrificed and we are reaping the benefit. They cut the trail which Black and Noyes and Kester and others have graded into a highway which we may travel in our automobiles.

Opposed to them, were such men as Elisha Townsend, Johnathan

Taft, J. D. White, Robert Arthur, Louis Jack, Bonwill, Krause, Allport, Cushing, J. H. McKellops and scores of others who condemned it as unfit for professional use, and would extract a tooth rather than resort to this means of saving it. But some of them lived long enough to change their minds.

Then follow a series of minor waves, such as: Arsenical paste for destroying pulps; a theory that saleratus was the great cause of tooth decay; hypnotism (1855), as means of painless operations; local anesthesia by either spray; zinc oxychlorid, which promised to be the ideal filling. But the next *great* wave was induced by the discovery of the cohesive property of gold by Dr. Wescott of Syracuse, N. Y. It has been cumulative from the first. The earliest form put upon the market was Watts sponge gold. It was very uneven in preparation, and while one package worked admirably, the next would be almost useless. The idea of annealing, which greatly facilitated its use, was first suggested by Dr. John W. Spear in 1855.

The possibilities of dental restoration were so greatly enhanced by this discovery that many men went wild with enthusiasm over it, and even sacrificed their lives in working it, as, for instance, Marshall H. Webb, of whom it is told that when a patient called to have a tooth extracted, he said, "It will cost you fifty cents to have that tooth extracted, but if you will let me fill it first, I will extract it for nothing." He died while yet a young man, and the records fail to show what became of his patients. He built beautiful monuments, but not more so than many other men, for I think all the profession take pride in the manipulation of this most alluring of metals. Many have helped in the development of the work, such as Dr. Robert Arthur of Philadelphia, Dr. E. Honsinger of Chicago, and thousands of others whom I will not mention have contributed their life's labor to the perfection of this method, which has probably meant more to the welfare of human teeth than any other one ideal for which we have striven. Could anything be more romantic than these thousands of unnamed, working and serving their fellow men?

Along with this wave and coincident, because of means for perfecting the use of cohesive gold, was the discovery of the rubber dam by Dr. S. C. Barnum. This great soul, generously and with

true professional spirit, gave to the profession the idea, but it was not without compensation, for it is a greater monument than stands to the credit of any general, for it is a monument to generosity and love, instead of hate and revenge.

And yet, gentlemen! It has been and is a fad, and frequently an imposition upon the patient by the operator, who is not willing to take the time and care to do without it.

It seems fitting here to mention "Extension for prevention," to follow up the sequence (but, chronologically, it should come later). In this great work, Dr. Black, together with his able assistants, Dr. Fred B. Noyes and others, worked out, in a scientific way, the principles of cavity preparation for filling, with the idea of preventing recurrence of decay, which is absolutely fundamental and irrefutable. And while not every man follows it in detail, most desire to do so. But the enthusiast has made a fad of it, and, with "just two or three more cuts of the chisel," he extends the cavity, where, when filled by the most skilful, it becomes a glaring example of how a fine mechanic may disfigure a patient's appearance. Or he cuts so broadly and extensively across the grinding surface to make a secure anchorage for the filling, that the whole inner cusp of the bicupid or molar is frequently broken off from what was, to begin with, a pretty good tooth. And this he calls the application of Dr. Black's principle, and lauds Dr. Black for this satisfactory method of mechanically mutilating teeth.

But to return to the waves of an earlier period. "The nerve capping" wave struck us with its good and ill which all must learn, I think, from experience. In 1854, a rational theory of preventing and curing abscesses (called ulceration) was promulgated. In 1866, root filling was developed, with its many failures. It was comparatively new to fill roots, and this development was the outgrowth of abscess treatment, for previous to that an abscessed tooth was usually condemned to extraction. It was this year in which the agitation of the idea of salivation being produced by wearing a vulcanite plate was on (due, of course, to mercury in the coloring matter), and one of our great dental societies expelled two members for making them. Some of these fads swept the country at such a rate that the idea would not be recognized by its author. Such a one was put out by Dr. Robert

Arthur, a man of fine mind, one of the first graduates of the Baltimore College, who had done splendid work in developing the cohesive-gold idea. In 1871, he published a book advocating the cutting of the approximal surfaces of teeth to prevent decay. His idea was radical enough, for he advocated cutting of surfaces not decayed, but he insisted upon preserving normal contact points. The idea swept the profession nearly off the "Doc" and resulted in a wholesale slaughter of teeth, a devastation never suspected by the author. And to the suffering public, which had come supplicating scientific treatment, to saw these great V-shaped spaces between the teeth was like giving the child awakened and crying for food at night a milk check, "good for one quart," to appease its hunger. And yet, gentlemen! was it not a recognition of the great principle underlying our prophylactic treatment of today, viz., that if the surfaces of the teeth are kept clean and polished, they will not decay?

But the next great tidal wave was that of bridge work; its wreckage is still to be seen in every community, bridges of gold, bridges of porcelain, "bridge of sighs," cantilever bridges (with little but the cant), bridges abominable, bridges serviceable, bridges removable, bridges improvable, bridges suspension, bridges pretension, bridges glaring, bridges daring, bridges swinging, bridges clangling, bridges busted, bridges cussed, bridges filthy, dentists guilty. The half is not told, and yet underlying it is one of the greatest and most beneficial principles ever given to dentistry. The wave has reacted, leaving many humiliated practitioners, many wiser dentists, as well as patients, and, also, many who are rejoicing in having found this grateful relief from a "horrid plate."

Then another series of lesser impulses, copper amalgam, alas, the mourning! many a patient wore black as a consequence of this fad. Zinc oxyphosphate, the ideal filling—but? Implantation, with all its hopes and regrets. Cocain and local anesthesia. Another whirl of hypnotism. The germ theory of decay, and with this is involved the development of sterilization, the story of which would of itself make an interesting paper. It has been a story of the conscientious and scientific fight with the destructive elements of nature, one of the greatest chapters in the history of

man's struggle for existence. A mastery for the day, overcoming all forms of bacterial life, has been succeeded by failure the next day. New forms not amenable to the process of sterilization have been discovered. At first, a few drops of phenol in some water was sure death to all the germs. Then experiments with mercury bichlorid, 1 to 500 and 1 to 1,000, boiling in water, boiling in soda; alcohol, copper sulphate, lysol, phenosalyl, hydro-naphthol, formalin; water standing in copper vessel, and many other sure cures have been tried, all having limitations in application or effectiveness.

And so the fight has gone on, and will go on with man's broadening intelligence and clearer vision, and perfected appliances, until realization is reached.

The next great wave was porcelain. It was not new, but it seemed new in its adaptation. As early as 1862, Dr. B. Wood gave to the public his plan of making porcelain inlays. Later, glass inlays were worked upon; the credit of development of the porcelain inlay is not due to any one man, but to a composite of ideas. Probably no one has done more than our Reeves to make practical the plan. And then not by any means is the credit all due to the profession, for the manufacturers have made the work possible. And right here, I wish to say, parenthetically, that the romance of dentistry would be decidedly incomplete without due credit being given to the manufacturers, who have universally given us the best of materials and workmanship in our equipment, and thereby made possible many things otherwise unattainable.

The porcelain fad has developed the dentist and his patient esthetically, more than any other one idea ever presented to the profession. It has made better workmen of all who have mastered it. It has made a demand for an abatement of glaring and conspicuous fillings and crowns; it has been abused, but it is not dead, nor will it die until the "ideal filling" is produced, and that is not yet in sight.

Another series of minor spasms: Cataphoresis; the gold inlay; orthodontia, as developed by Drs. Case and Angle, has revolutionized ideas in correction of malformations. We are not all masters, nor ever expect to be, and the work really belongs to the specialist, consequently can hardly be classed as a fad, but rather a great triumph in bloodless surgery. Pyorrhea treatment does

anyone *know* all about it yet? Porcelain jacket crowns, a wonderful step, but not as strong as cast steel, nor applicable to every case, where the patient has the price. Silicate cement, which makes many promises yet unfulfilled.

Now we see advancing, yes, already upon us, what is it? A tidal wave? Yes, with a supplemental one, yet not really supplemental, for they are not together nor yet contesting. The great overwhelming wave is *casting* in its many forms and applications. The minor move in prophylaxis. Undoubtedly casting is the most revolutionary process ever given to dentistry. The idea, so far as I am able to learn, originated with a Frenchman, who presented a paper upon it about 1890, but the development and adaptation is the work of our beloved Taggart, who has given us many excellent and practical ideas. The possibilities are almost unlimited; the abuses will be many and glaring. It is, however, the consummation of art, in mechanical repair.

The peculiar thing is that practically all of the work of dentistry up to the present has been upon the repair, and the development of means to that end, while almost nothing has been done in the line of prevention.

Under the watchword of "prophylaxis," an effort is being made to learn some things we ought to know. First, if the theory is true, that clean teeth will not decay. Second, how to clean teeth and how to teach our patients. Third, if the theory is true, how often must the environment of teeth be changed? Fourth, how can we educate the public? Dr. D. D. Smith of Philadelphia has been doing fine work in this line for ten years and more; our Dr. James has convinced himself of the truth of the theory and is attaining remarkable results, and many others are doing excellent work, making records and compiling statistics. This line of work presents as great possibilities for professional development as anything today interesting the profession.

Among the large ideals of the profession and professional co-operation was that of a Dental Life Insurance Company agitated about 1870. This came to naught, but in 1888 Dr. Crouse, through his indomitable will and indefatigable labor, succeeded in organizing the "Dental Protective Association," having about six thousand members, the result of which has been to protect the whole

dental profession from fraudulent patent royalties, to the amount of millions of dollars. Dr. Crouse had the ideal of organizing a great Cooperative Dental Supply Company, and while this has not been realized, it was due to the fact that we are not yet far enough along for cooperation, which requires more than professional courtesy. It requires brotherly love. I wish to acknowledge my personal and professional obligation to Dr. Crouse for his service to me.

Here I would like to write a series of biographies of those we have loved, still love and revere. As I go back over the literature of the past seventy-five years, my heart goes out to these men who have wrought so faithfully for us in the building of a profession. I come to know them and love them, and as the perspective of time blends their lives softly into the great professional light of progress, there is no harshness, only loving remembrance of helpful lives.

These biographies would contain words of gratitude to Dr. James E. Garretson for a life's inspiration. There would be volumes of appreciative expression to such men as White and Taft, McQuillen, Richmond, Townsend, Bogue, Atkinson, Jack, Bonwill, Webb, Darby, Flagg, Arthur, Barnum, McKellops, Allport, Cushing, Barrett, Honsinger, Judd, Kitchen, Kennicott, Truman, Taylor and many others. There would be an attempt to express my obligation to Dr. G. V. Black for services rendered and the son he has given us. They would contain words of love and esteem for Dr. Edmund Noyes for his fraternal and paternal kindness and the son *he* has given us; and to the sons, Dr. Arthur Black and Dr. Fred B. Noyes, there would be my grateful appreciation for what they have done and are doing for the making of a great profession. There would be a glowing tribute to Dr. W. H. Taggart for his many services; to Dr. C. E. Bentley for his inspiring words. There would be words of love, gratitude and appreciation for Perry, Reid, Roach, Hinkins, Prothero, Haskell, Johnson, Cormany, Pruyn, Haskins, Frazee, Hazel, Hanaford, Koch, Cook, Gethro, Helm, Waltz, Peck, Rohland, Pritchett, Harlan, MaWhinney, Kirk, Allen, Ottolengui, Duncan, Gilmer, Brophy, Goslee, Buckley, Gallie, Royce and more than a thousand others, for every man in the profession is doing his best to help, but we hope and expect him to do more.

I would there were time and space to go into reminiscences, to tell of Dr. Black's resolution forty years ago to devote at least one hour a day to study. How he has kept that resolution. How he has wrought and worked and given of himself, for professional advancement. I would like to narrate Dr. Cushing's sacrifice, and Dr. Taggart's devotion to development of the casting idea.

I should like to go into the philosophy of the contending forces which develop the professional ideal. The conserving force on the one hand, which is willing to let "well enough alone." The urge on the other, which is constantly reaching out to greater possibilities, for the attitude toward life and things means everything for attainment. As Ella Wheeler Wilcox expresses it:

"One ship drives east and another drives west,  
With the self-same winds that blow;  
'Tis the set of the sails, and not the gales,  
Which tell us the way to go.

"Like the winds of the sea are the ways of Fate,  
As we voyage along through life,  
'Tis the set of the soul that decides the goal,  
And not the calm or the strife."

I have given you a short sketch of the impulses which have moved our predecessors, and which we recognize as the Professional Urge, The Grand Passion. The Hope of Hopes. The hope that we, too, may contribute something to make life better and our profession grander. They work for those they never saw, for generations yet to come. They wrought amid the scoffs and jeers of their time, for a reward they knew not of. And we bring them today our loving tribute for their generous sacrifices to their professional ideals.

Out of their fads and impulses have come the progress and enrichment of the profession, so out of our enthusiasm and work and cooperation, may our profession be advanced, our loves fulfilled, our services triumphant, our ideals realized.—*Dental Review.*

THE CARE AND TREATMENT OF CHILDREN'S TEETH. By T. H. Agnew, D.D.S., Medina, N. Y. In the preparation of this paper I have gone to some extent beyond the scope of my subject, but in defense of this I have felt for many years that the vast majority of people were not conscious of the serious mistakes they were making and the almost unpardonable crime they were committing in not properly caring for children's teeth.

It does not take the practitioner long to decide the cause, for hardly a day goes by with a busy dentist, especially if he has a general practice, but that some mistaken mother will admit to him that she did not know anything but extraction could relieve her little one from such excruciating pain.

The dense ignorance that prevails on every hand regarding the life and functions of the deciduous teeth and the time that we should look for the eruption of the permanent ones, is enough to discourage the dentist, who is anxious to do his best for his patients and preserve their natural teeth.

What we need today more than anything else is some thorough system of educating the children who attend our public schools (for the great masses cannot be reached in any other way) regarding the value of the deciduous teeth; how to keep them clean, and the necessity of having them filled when cavities first present themselves, or as soon afterward as conditions will allow; also the necessity of retaining them in the mouth until the permanent teeth are ready to erupt, not only for the purpose that they may properly masticate their food, but that the dental arch might be properly developed for the reception of the permanent set.

I believe that this is the only means of getting at the great masses who never visit a dental office until compelled to do so by suffering so great that home remedies fail to relieve.

It ought to be forcibly impressed on the mind of every child how dirty and decayed teeth detract from their personal appearance, thus, if possible, touching their pride, and that foul breath and disease are concomitant of such conditions.

If lectures along these lines were delivered in our public schools once a week, extending from the primary to sixth grades, and a careful examination made of every child's mouth three or four times a year, the result of the examination marked on a chart,

with recommendations to the parents or guardians as to what should be done to put the mouth in proper condition, thus educating the parents as well as the children, it would not be long before the excuse of ignorance would be done away with and the well-being and happiness of the children wonderfully enhanced, providing they fall into the hands of careful dentists, who have the patience to give them the required attention.

I mention this last condition, knowing full well what undesirable patients children are as a rule, and what a vast amount of patience is required to give them anything like proper care.

I have but little hesitation in saying that there is not a dentist present who would not rather work twice the length of time for an adult for the same remuneration, where he could see that he had done something of permanence for his patient, than to fret and bother with the deciduous teeth. But that does not relieve us of the responsibility and the professional debt we owe to them. Therefore, we must meet with courage the conditions that are presented and do the best we can to save them until they have performed their full function.

We are all more or less familiar with the sad havoc that has been wrought in many instances by the early extraction of these teeth, how mastication has been impaired and the dental arch deprived of its principal means of development, thereby rendering it incapable of taking care of the permanent teeth when the time has come for their eruption. I recall two or three cases that came under my observation where a dentist had extracted the upper cuspids because the first bicuspids did not have room to erupt in their proper place, the result of which was the contraction of the arch to such an extent that the lateral incisors and the first bicuspid grew so close together that the cuspids were forced entirely outside.

My experience with children is that only in very rare cases should the forceps be used on the deciduous teeth, for by the time the permanent teeth have grown into the position they ought to occupy their roots will have so fully absorbed that they will no longer stay in the mouth.

The treatment and filling of deciduous teeth is necessarily somewhat different from that of the permanent ones, not only on ac-

count of the character of the patients we have to deal with, but also on account of the difference in the size and quantity of the component parts. For this reason the operator is restricted to what might properly be called temporary work, and it is rarely necessary to subject our little patients to long and tiresome operations in order to keep them comfortable during the life and usefulness of these teeth.

Complications arise in cases where the sin of neglect has been allowed to have full sway for such a length of time that when the patient applies for treatment the crown of the tooth is nearly, if not all, gone, and the root is so sore from the abscessed condition which we find invariably present that it is often quite impossible to relieve the patient without lancing, which most of us very much dislike to do. But, if necessary, it ought to be done rather than to resort to extraction, for the roots aid materially in the development of the jaw even after the crown has been lost.

In such cases the education of the parent is often essential, for in a great majority of cases they will try to persuade the dentist to relieve the child of the possibility of a recurrence of such condition by taking the offending member out.

The impression, which often is prevalent, that we can afford to neglect these teeth must be corrected at every opportunity, for beyond the fact of the possibility of much suffering and injury to the health, there is a question of habit, which has an important bearing upon the future welfare of the patient. We all know how impressionable these little folks are, and how impressions made in the tender years of childhood are liable to last throughout a lifetime, and will work either for the benefit or the injury of the one acquiring a habit.

If a decayed deciduous tooth is allowed to go without attention it will soon become sensitive to mastication, and the little patient, without being able to explain the real source of discomfort, avoids chewing on the side of the mouth affected. This leads to imperfect mastication, if not to a process of bolting, which undoubtedly clings to a person as a habit through life.

When it is considered that thorough mastication is an important factor in the health of the individual, we can readily see how important it is that we keep the teeth of children in such condition

that they can comfortably triturate their food and thus be conducive of habits that will redound to their benefit rather than to their injury.

In filling these teeth we are necessarily limited to cement and amalgam. For the anterior teeth cement must be relied upon, on account of the nature of the decay which is peculiar to these teeth.

The cavities are often shallow, and on account of not wishing to hurt the little patient by using the dental engine, we are compelled to rely upon excavators to remove the decayed matter, and also on the adhesive quality of the cement to hold the filling in position.

In filling these cavities I find the thin celluloid strips of great value in pressing the filling into position, at the same time giving it the greatest possible density under pressure. This also leaves the filling with a smooth, glossy finish, which we cannot obtain by instrumentation.

Ordinarily it is not a difficult matter to save the anterior teeth until time for the eruption of the permanent ones, on account of the early age at which they are shed, but the care of the molars is often quite another question. The additional three or four years that they should remain in the mouth are often very trying times to both patient and operator.

Occlusal cavities ordinarily are easy to manage and can readily be filled (if the pulp is not too nearly exposed) with cement or amalgam, the choice being determined by the degree of thoroughness with which the cavity can be prepared, amalgam being preferable on account of its greater permanency.

Mesial and distal cavities always present greater difficulties, because the decay usually extends almost across the full surface of the tooth, thus leaving very little opportunity to get much surface to which the cement can adhere, so that when the pressure of mastication is exerted upon it, often the filling will loosen, a most discouraging occurrence to the operator as well as to the patient.

Another factor which tends to make these cavities difficult is that they usually are very sensitive when shallow, and if deep thorough cleaning nearly always brings about exposure. This condition cannot be met the same as it can in the permanent teeth, for if it is found necessary to destroy the pulp arsenic tri-

oxid must not be used, on account of the danger to the surrounding tissues, but if the pulp has not given trouble sufficient to cause congestion, then it can be capped with a paste made of oil of cloves and zinc oxid carefully flowed over the exposed part and allowed to harden before applying the more permanent filling. This process will in all probability save the tooth for a year or two, but after a pulp is once exposed in a deciduous tooth it is usually only a question of time before it will die.

In treating abscesses of the deciduous teeth we are often confronted with quite a serious problem, not because it is hard to gain access to the canals, but on account of the exceedingly nervous condition in which we usually find the patient.

It is very hard indeed to approach a child under such circumstances, and the operation necessary to relieve them must be performed with the greatest tenderness. Usually all I do at the first sitting is to open up the pulp chamber and leave it clear for a day or two until the soreness disappears; then when the little patient comes a second time, cleanse the canals as thoroughly as possible, washing them out well with some pleasant antiseptic solution, then packing with cotton medicate with the oil of cloves. It sometimes takes two or three treatments of this kind to perfectly heal an abscess, but usually they are quite susceptible to treatment and yield very readily.

Guttapercha and oil of eucalyptol mixed to a consistency not much thicker than cream, worked into the canals with a smooth broach and the cavity filled with cement, will give us the most satisfactory results.—*Dental Practice.*

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THE EDUCATION OF THE DENTIST. By Edward C. Kirk, D.D.S., Sc.D., Philadelphia, Pa. It has been said that an eminent physicist who once wrote a treatise upon electricity made this significant statement in the preface of his book: "There are two kinds of electricity; one is found upon college blackboards, the other is found in nature. This book treats of the latter." The incident is pertinent to our present topic, for the reason that the subject of dental education has been dealt with in quite similar fashion. It has been presented and discussed from the point of view of the theorist and reformer quite as extensively

as it has been by those experienced in the work of dental education, and who have a practical familiarity with its conditions. Recognizing these two points of view, it is my desire to treat the subject from the standpoint of the latter. I take it to be self-evident that the purpose of dental education is to make dentists, and assuming this to be granted, then our problem becomes simply a question of adapting means to ends, or of practically answering the question, how shall we make dentists? But this necessarily raises the further question—what is a dentist? If we define the term as "one who practices dentistry," it brings us face to face with the demand for a definition of dentistry, and it is just our conception of what dentistry is that is fundamental to the whole problem of dental education.

The concepts of dentistry as descriptive of the calling of the dentist have undergone much change as the science and art of dentistry have developed, and as inquiry into its more intimate conditions and relationships has enlarged our ideas of its scope and possibilities. Indeed, the history of the development of dentistry is quite analogous to that of all other departments of knowledge in the respect that, beginning as a heterogeneous collection of empirically used data continually growing by additions of new facts, these have gradually undergone organization into or toward that condition of orderly arrangement and rational use which is characteristic of what we call science. No one who has interested himself in even the casual study of the dental literature of over fifty years ago can have failed to notice the difference in the character of the problems with which our professional predecessors of that period concerned themselves, as compared with those which absorb the attention of the dental profession at the present time. There was no such thing as "dental science" as we use that phrase today; dentistry was a mechanical art almost exclusively, and it was practiced empirically almost without exception. It is true that some interest was shown in anatomy and in the histology of the dental tissues, yet the crudest ideas as to physiology and pathology prevailed.

The mechanical motif dominated all of dental thought, and the mental atmosphere of the dentistry of that period smacked of the laboratory and the shop. The most prominent practition-

ers described the way they "put up jobs" in gold or silver, just as jobs of carpentry or plumbing were done; teeth ordinarily were "plugged," as holes in casks or walls were plugged and are plugged today. Provision was made for drainage of pus by "tap holes" in the sides of roots, or, in the adjustment of "pivot" teeth, by cutting longitudinal grooves in the wooden dowel to act as cloacæ to drain away what was called the "secretion" from "ulcerated fangs." The mechanics of dentistry was in the early days about all there was of dentistry, hence it came about that a dentist was regarded solely as a repairer and restorer of teeth, a manufacturer of teeth, a higher type of artisan—higher not because the excellence of his handicraft was necessarily of a superior order to that of many other kinds of skilled workmen, but rather because his finger-skill was expended in affording relief by mechanical means from certain ills of the human body.

The attitude of mind both of the dental profession and of the public mind as well has in the intervening years been completely revolutionized with regard to the meaning of dentistry. Our profession has been undergoing not only a process of development, but a process of orientation, with the result that dentistry presents itself in an entirely new and different aspect for our study and consideration. In its formative period, with the mechanical ideal the dominant feature of dental practice, the apprenticeship form of training, borrowed from the methods of the "shop," subserved, for the time being, the ends of dental education. Today, with our larger modern conception of the scope of dentistry, not a few enthusiasts are asking that a collegiate degree in arts or science be required of the dental matriculant as evidence of his fitness to enter upon the course of professional study. It is the significance of this demand for a larger and more efficient preparatory education as a prerequisite for entrance upon the curriculum of dental professional training to which, mainly, I would direct your attention, and I have been at some pains to select the title of this paper with reference to that particular feature of our educational problem.

The phrase "dental education" is commonly applied exclusively to the educational content of the dental professional curriculum,

but the education of the dentist as a matter of fact embodies his entire preparation for his life-work, which is certainly inclusive of his preliminary training, and it is this larger view of the subject that I wish to discuss. The mechanical motif, to which I have already referred as dominating almost exclusively the earlier stages of development in dentistry, has never ceased to be, nor will it ever cease to be, an essential controlling factor in our work. All of our manipulative procedures involving mechanical adaptation of materials to therapeutic and restorative ends are of immensely greater importance and more general utility and application now than they have ever been. Nothing has so characterized the growth of dental art as the increasing variety of its mechanical processes and the excellence and ingenuity of its mechanical results; but the fundamental alteration which in the process of time has been wrought out in the professional mind of dentistry is the recognition of the fact that dentistry is not mechanics, but the science and art of caring for, saving and restoring the dental mechanism in a condition of normal functional usefulness, and that mechanics is a means to that end—a difference not unlike that between medicine and pharmacy. But if dentistry be not mechanics, it is equally and logically true that mechanics is not dentistry, and it is the recognition of this truism that characterizes the dentistry of today as distinguished from the dentistry of the past.

What has brought about this changed attitude of mind with regard to the meaning of dentistry? The leaven which in the course of time has leavened the whole lump is the factor of vitality, which dentistry has in all of its work been compelled to reckon with. In view of the comparatively crude notions which were prevalent respecting disease in general, in the period when dentistry as a profession had its birth, it is not surprising that the vital aspect of dental work should have been accorded a secondary place; nor, in view of the obvious success of its mechanical procedures, is it remarkable that this phase of the work should have filled the whole dental horizon. But as the relations of all dental operations to the vital base upon which they were performed came, through observation and experience, to be more definitely recognized, and as scientific research into the biologic

problems of human nutrition and disease causation came to shed a flood of light upon every department of the healing art, an immense increase of knowledge bearing upon dental practice was accumulated, with the promise of still greater extension of the field; and above all there came a realization of the important fact that, in order to fit men for the practice of dentistry, an education sufficiently comprehensive to embrace this great accumulation of data, so that it could be intelligently utilized in practice, must be demanded and provided. The vital relationships of the teeth as parts of the bodily mechanism are so generally recognized that no operator today can disregard with impunity this factor in his work. Hence it is that our system of dental education is now based upon a comprehensive knowledge of the whole human organism, its composition, structure and function, from which necessarily we derive the subjects of chemistry, anatomy, histology, physiology and pathology, including bacteriology, as elements of the dental professional curriculum. Indeed, so necessary is a knowledge of the human organism to the rational practice of dentistry that it may be safely said that the dental curriculum now includes all of those subjects that are fundamental to the whole healing art.

Nobody doubts the wisdom of demanding a broad and full professional training for the dentist—or perhaps it would be more in accordance with the facts to say that no one has successfully challenged the wisdom of such a course, or the reasonableness of the training demanded by the modern dental curriculum. That the dental profession demands this enlarged type of professional education, and that the colleges are using their best endeavors to furnish it, is the material demonstration of the fact that dentistry is no longer regarded as a mechanical art by those most competent to pass judgment on that question, but that the ideal of dentistry has grown until it is now considered to be a special department of the science and art of healing, necessitating a broad fundamental training in the essentials of medical science as a basis upon which to erect the superstructure of that special education which constitutes the technical training of the dental practitioner.

Our ideal of what the education of the dentist ought to be is

reasonably clear; how it should be achieved is another and, in certain respects, a more complex problem. In order that the dental student shall be able to grasp all that the professional course contains; in order that he shall not only be able to comprehend its meaning, but above all that he shall be able to make intelligent use of the instruction afforded him by the curriculum, it is a prerequisite that his preliminary training shall have so fitted him as to methods of study, so developed his reasoning power and the habit of intelligent observation, that his professional course shall be something more to him than a memory-cramming contest. Recognizing the necessity for thorough preliminary training, the admission standards of dental schools have in the past few years been gradually raised from practically the zero point until the limit of a standard four years' high-school preparation has been successfully reached. It is questionable whether for some time to come it would be advisable, even practicable, to advance the entrance standard beyond that of high-school graduation for reasons ably argued in a paper by Dr. G. V. Black in the *Dental Review* for July of last year, and for another reason, which to me seems equally valid and sound in principle, viz., that the high school is, generally speaking, the maximum of educational opportunity that the state furnishes free to its citizens. Nor does it seem to be either just or practicable to further prolong the period of preparation required of the professional man before he is fitted to take up seriously and efficiently the duties of his life-work. It would, in my opinion, be quite unnecessary to extend the period of preparation if the kind and quality of his preparatory education were given proper emphasis, but in lieu thereof the useless attempt is made to improve it by giving him more of the same kind of imperfect training that he is already subjected to. In view of the fact that the dentist is in his degree and sphere a conservator of the public health, and in that capacity serves the public, there should not, as a matter of principle, be created any hiatus between the maximum point of free public education and the point of admission to the professional schools. It will of course be recognized that all standards of admission as well as those of advancement in course, or of graduation, are minimum standards; they express

the least educational attainment upon which admission, advancement or graduation can be allowed, and are not prohibitive of higher individual attainment in any case.

But, notwithstanding the material advancement of admission standards, the demand is not infrequently heard for still larger educational qualifications for entrance to our dental professional schools, and the hope is expressed that in the near future it will become practicable to demand a collegiate degree in arts or science as an entrance qualification. Among the reasons alleged for the need for further preliminary preparation is that the men now presenting themselves as students, having the training represented by the present entrance standard of high-school graduation, have not sufficient education to enable them to clearly comprehend the studies of the dental professional course. The output of the dental colleges has been from time to time subjected to much adverse criticism for the degree of professional incompetence which it manifests in various ways, and harsh things have been said about the dental schools and the faulty methods of their teaching, because of alleged weakness in the training of those whom they graduate. Indeed, so common is the attitude of criticism as directed toward our dental educational institutions that it does seem worth while occasionally to look somewhat carefully into the matter and see if possible where the fault lies. Before your essayist became occupied in the practical work of dental education he held very pronounced views on the subject, and was inclined to emphasize them somewhat dogmatically, but some years of experience in the actual work has brought with it a better understanding of some of the obstacles to be overcome and a more definite opinion as to their cause. It has been an experience which has served to replace much ideality with a fair proportion of practicality, and particularly has it brought about a realization of the truth that while one cannot make a silken purse from a sow's ear, it is quite possible to manufacture a reasonably substantial leathern one out of that same appendage of the *Sus scrofa*, while in the meantime the material from which to construct the silken ones is being sought and hoped for.

Let me, then, say frankly that my experience leads me to believe it to be in the main true that but a small minority of

dental graduates get that degree of training or that extent of education out of the course that they should, in view of the fulness of the curriculum and the opportunities that it affords for efficient professional preparation. I do not believe that this deficiency in the quality of the result can, in all fairness, be charged mainly to faulty methods of teaching nor to inefficiency of teachers in dental schools; for, making a liberal allowance for defects in these phases of the problem, it still remains the undeniable fact that a large proportion of dental students have not a sufficiently developed mental capacity to enable them to grasp the scientific and philosophic aspects of the dental curriculum. This deficiency of mental capacity is manifested mainly as an undeveloped reasoning faculty—an inability to do sustained and independent thinking. If it would be too broad a claim to state that dentistry is a science, it is at least certainly true that dentistry is established today upon a scientific basis, and it therefore demands some considerable training in precise modes of thinking and reasoning for its proper comprehension and successful practice. No student can get what he ought to get out of the professional course unless he has previously acquired through the discipline of his preparatory education that cultural result which is characterized by the ability to think and reason for himself in such a precise manner as to enable him to form reasonably correct conclusions. As a matter of fact, only a minority of dental students are qualified as they ought to be in this essential feature. In many instances this defect in reasoning power is to some extent remedied by the intellectual disciplinary effect of the scientific studies of the professional course; but, again, it more often appears that the handicap of bad methods of study acquired during the preparatory course persists throughout the professional course, and the student gets through by a process of pure memorizing—absorbing descriptions and verbal formulas—by remembering which he is able to pass examinations, but with scarcely any real or intelligent understanding of his subjects. Once the diploma is delivered into his hands his collection of memorized data leaves his surcharged brain as empty as a last year's bird's nest; the whole scientific foundation of his life-work vanishes from under it, and he frankly tells you that he is a

"practical man"—has no use for "theory," and never could understand why such things as anatomy, chemistry, physiology, bacteriology, pathology, etc., were ever put into the curriculum; for his own part he only studied them because he had to have them in order to get through his "exams." The picture is not over-drawn. Any teacher who has had a dozen years or even less of experience in dental educational work will recognize its painfully commonplace truthfulness.

Dr. Black, in his paper already referred to, builds much of his argument upon the major premise that dentistry, being a department of the healing art, is therefore a public necessity. With this view I think all will agree. So fully is this fact realized that in all states and countries the standards of dental education are defined and regulated by laws enacted as a function of the police power. Not only does the state in the exercise of its rights of police guardianship determine the minimum of professional qualification, but in a majority of instances it prescribes the minimum of preparatory education which the matriculant must possess before he may be permitted to enter upon the higher course of professional training—which is perfectly logical and exactly as it should be. It is interesting to note also that thus far no state has placed its requirement as to preparatory education for admission to professional schools in any instance beyond the limit of the free education which the state provides for its citizens—and this also is perfectly logical and exactly as it should be. The plan of organization by which the completion of the public high-school course is directly articulated with the dental professional course, from my own point of view, leaves nothing to be desired in the matter of equity and reasonableness. It is, however, true, as I have already indicated, that there is much to be desired in the quality of the student product which the public high schools are delivering to the professional schools as the material from which to make dental professional men.

"By their fruits ye shall know them" is an axiom quite as applicable to educational systems as it is to figs, thistles, or to men, so that I shall undertake to speak somewhat critically of certain defective features of the preparatory education of the dentist, as I have deduced them from considerable observation

of the deficiencies of high-school graduates during their dental professional course.

I have previously referred to the lack of ability to reason logically, so often manifested among students, and their tendency to substitute memorizing for thinking. Indeed, with many their only concept of the meaning of study is to memorize. When a boy has had from ten to twelve years of school training and emanates from the high school with no other cultural result than a brain stuffed with data about which he cannot intelligently reason, he has wasted some of the best time of his life in bad methods of study, or it has been wasted for him by bad methods of teaching. I do not wish to be misunderstood as demanding that the high-school graduate shall be a finished product characterized by that type of intellectual development that can only come with riper years and broad life experience, but I do most certainly contend that much of the school work demanded of children is not adapted to and much less is it designed to develop the reasoning faculty at all.

Evidence of this is found, first, in faulty language work, or at any rate in faulty language culture. Language is fundamental. Words are the tools of thought; without language thought is impossible. In our modern system of language instruction something is lacking; we seem to have lost the disciplinary effect of the drudgery of learning to spell, of learning the etymologic derivation of the words we use; words have become mere formulas for sounds, to be spelled in any way that will interpret their sound as it has struck the ear of the hearer, with the result that the user has failed to acquire that deeper and more intimate acquaintance with these mental work-tools that those of a previous generation derived from spelling drill, definitions and etymology before the crime of sight-reading infected a whole generation of teachers and crippled the reasoning powers of the rising generation under their charge. Still, even this evil has had some compensations, for it has justified the existence of the dental editor, much of whose activity is concerned with the effort to rescue the English language from the assaults and batteries perpetrated upon it by some of these misguided youths when in after years they write communications for their professional magazines.

Lest I be accused of overstating the case, let me give a few examples of the word-distortion taken at random from final examination papers of American boys who were in each case either high-school graduates or had had a preparatory training the full equivalent of a four years' high-school course: *Plethora. Paraffine. Nutrition. Molocule. Puss. Paraphin. Irrigation. Euren* = urine, *Cannels. Convultions. Illiminate. Osteoclasp. Aspestos. Errupt. Malonutrition. Caries are. Ankalousus. Appical. Tarter. Euratic acid* = uric acid. *Idodide. Pericemential. Systemn. Bight* = bite.

Dentistry is not the only sufferer from this tendency to educational abortion; general medicine is equally a victim of it. The president of the Board of Medical Examiners of Pennsylvania has furnished me with the following illustrative example. One of the questions propounded at the December examination for medical license in Pennsylvania was as follows: "Q. Discuss the forms of electricity used in medicine." The answer of one applicant was—"A. There are two kinds, foradic and sporadic—the first is used intermittently, the second is used continuously." I have a collection of analogous examples large enough to fill several editions of a comic almanac. Of eighty-eight applicants, holders of medical diplomas, thirty-six failed to pass the December licensing examination, because of proofed incompetence, mainly of the character evidenced by the example which I have just quoted. These instances indicate something much more important than ordinary misspelling; they indicate a mental blindness as to the meaning of the words or their proper use and application. No student drilled in the etymologic derivation of these terms could possibly go so far wrong in spelling them. They are to his consciousness only meaningless sounds which he has vainly endeavored to associate with the ideas they were meant to convey, with the result that he has grasped neither the word nor the idea. So commonly is this indication of defective language work manifested among high-school graduates that I am forced to the belief that improvement in the teaching system is sadly needed.

It would take up too much of your time and overtax your patience for me to pursue this phase of the subject further in detail, so that I can only suggest that in my own belief the present con-

dition is due, in large degree, to the elimination of the old-fashioned study of etymology from the lower-grade schools, and the attempted substitution of a smattering of Latin for it; the introduction of sight-reading as a make-shift to lessen the drudgery of learning to spell, and the lack of language drill as a continuous and inherent part of school discipline in connection with all other subjects of the course throughout the whole term of school experience.

Another point to which I wish to direct attention is what I regard as an inconsistency, if not worse, in the preparatory educational scheme in this country—viz., the inattention to and lack of appreciation by our school authorities of the importance of science teaching in the lower-grade schools. By science teaching, I mean, particularly, elementary instruction in physics and chemistry.

Professor Adami, in his recent work on Inflammation, says in his preface, "Your child, once he begins to perceive, passes into the stage of perpetual 'Why?' He is not satisfied with the recognition of phenomena, but would know from his elders how they came about. It is deserving of note that at first those explanations satisfy him that appeal to the imagination rather than to the reason. He is not prepared to appreciate and to accept mathematical proof; he lives in fairyland. There are those who never pass beyond this stage of deference to authority. But some, at least, as manhood approaches, begin to think for themselves—begin to see that the explanations given by their elders are not all of them adequate, nor all satisfactory, and so is reached the stage of youthful *Sturm und Drang*, during which the brighter spirits, heedless of authority, in the exuberance of youthful imagination proceed impatiently to weave and elaborate explanations of their own. It may be that despite their little experience and the fewness of the facts on which they base themselves, they light upon truths of wide scope. But too often it happens that inadequate hypotheses are light-heartedly imagined and given to the world. During this period, hypothesis after hypothesis may be enunciated only to be found wanting. As manhood is entered into, the individual learns that it is not essential to discover an immediate explanation for everything, and now begins patiently to accumulate data in the hope that wider experience and fuller command of facts will eventually afford material for the right solution of a

given problem. Thus at last, with the necessary experience, maturity and ripe powers of reasoning are attained."

While this admirable picture of the process of intellectual development of the reasoning individual leaves nothing to be desired in its portrayal of the progressive steps toward the power of precise, independent thinking, it fails to indicate why it is that "There are those who never pass beyond the stage of deference to authority," and it is with that class of cases that we are here most concerned. The explanation is not far to seek. In the absence of the ability to form trustworthy judgments for himself based upon experience and proper educational training, the individual has no other recourse, in case of necessity, than to make use of the judgment of others, hence dependence upon authority by the individual lacking the faculty of independent judgment becomes habitually necessary. For the reason that the study of physics and chemistry are valuable as discipline in precise methods of thinking and in the ability to form correct conclusions from given data, the elements of these sciences should be a part of the common school training. But they should be made a part of the early school training, because of their objective character and their direct bearing upon the natural educational forces of the child's environment. Professor Adami has well said, "Once your child begins to perceive, he passes into the stage of perpetual 'Why?'" But this "Why?" is in its very beginning related to the things of its environment. It begins to study physics with its first sense perceptions, it learns naturally much that is important about the properties of matter, and has acquired a considerable store of valuable practical knowledge in that direction—when, instead of taking nature's educational hint and developing its education along this biologic line of least resistance, we as quickly as possible hustle it off to school and begin the artificial process of cramming its memory with a mass of data consisting largely of what someone else has found out or thought they have found out. The fundamental inquiry into the properties of matter with which the child began its conscious existence should have been developed and enlarged by easy educational gradations until the further natural inquiry into the composition of matter; that is to say, the elements of chemistry could be introduced normally and easily into

the educational scheme of the child. As it now is, the serious study of these subjects, fundamental to all of the material interests and activities of human life, is postponed until the high-school grade, and given at a time and under conditions that, judging from the results, are farcical. It is, in the opinion of your essayist, an anachronism, an absurdity, that professional schools of dentistry or of medicine should be required to teach elementary chemistry or elementary physics; they should be relegated to the preparatory schools, eliminated from the professional curriculum and classed as entrance requirements. The only chemistry or physics that should be given a place in dental or medical schools is the special applications of those sciences to the work of the professional course. As it is today, work in these branches curtails the time and energy of the student, which could be more profitably employed, and were it not for the necessity of his having at least some general notions of chemistry and physics they could well give place to other things.

I make the plea for more thorough science teaching as part of the preparatory education of the dentist for other reasons. First, because its cultural effect, its mind-training power, is such that through that means we may hope to later turn into the dental profession a larger number of men with that kind and degree of training that will better fit them to deal with the many problems, both scientific and practical, which our profession now presents for solution. We are sadly lacking in men so trained. I should not care to be called upon to give an estimate of the proportion of dental practitioners who have even a working knowledge of chemistry, or of the proportion who can intelligently discuss a paper based upon research in that department of science; and yet no similar profession has more need of such knowledge, or is more dependent upon chemistry as a basis for its work.

For its power to develop the reasoning faculty in habits of precise thinking; for its objectivity as a pedagogic means; for its intrinsic usefulness—therefore I plead for the more serious consideration of science training as part of our common school system; and, for the betterment of the prospective dental student material, it seems to me to be our duty as professional men to demand this improvement.

Time does not permit me to go into further detail, yet there is much more that could be properly said, and ought to be said, upon this vital topic. We have all realized the necessity for an improvement in standards of education for the dentist, and in our desire to attain this improvement we have talked much of raising the standard by an expansion or enlargement of the entrance requirement to our professional schools. My plea is for an improvement in the kind of standard, not its amount—a better educational product, better trained in the subjects of the preparatory curriculum; the recognition by the state that in exercising its right to create standards it also incurs the responsibility of training and educating prospective matriculants up to the intellectual plane which its prescribed standard implies. This, I believe, as a general proposition, it does not now do as well as it should. I do not defend the professional schools from one iota of criticism to which they may be justly entitled. I contend that a professional school that knowingly graduates an incompetent man is guilty of a dishonorable act, a breach of public trust.

It may be argued that the way to prevent incompetents from being graduated is to examine all applicants for admission and thus exclude the unfit. To this it may be said in answer that certificates of our public school authorities ought to be acceptable at their face value. The examination of all applicants, under present conditions, with rigid exclusion of the unfit, would undoubtedly greatly reduce the number of admissions, and tend to fix the responsibility where it belongs. There is, however, the other alternative of practically testing the fitness of the student's preparation by accepting his high-school certificate, and admitting him to the first year of the professional course, at the end of which period his progress should be arrested if he is found to be incompetent. This seems to be a fairer method than by exclusion through an entrance examination, for the reason that in a considerable number of instances, men weak at the beginning have, under the discipline of the course, made satisfactory improvement.

I ask that you will consider the preparatory education of the dentist as your own problem—a question which it is of the utmost importance for you to use your personal effort in solving satisfactorily. There is no good reason, with the influence we

can individually and unitedly exert, why our educational authorities should not conform certain phases of their work more harmoniously with our professional educational needs. The results of our preparatory educational work do not compare favorably with the product of European preparatory educational institutions, in my experience. We waste too much time, and gain less in education. Our American high-school graduate is not as well trained as the English, German, Swiss or French lad who has spent the same amount of time on the work of an equivalent grade of school curriculum. This should not be, and it is my hope that the dental profession for its own sake may at least make the earnest attempt to get what it needs in the matter of sound training for this important life-work.—*Dental Cosmos.*

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TOOTH ROOTS. By N. S. Hoff, D.D.S., Ann Arbor, Mich. For the last twenty-five years, it would seem, the dental profession has given the larger part of its time and thought to the saving or repairing of the crowns of the teeth, and consequently has attached an undue importance to that portion of the tooth, to the neglect of the root more particularly. It is true we have been conscious all this while that no crown, however perfectly formed and preserved, would be of much value without a root to stand it on. The propaganda for oral prophylaxis so strenuously carried on by Dr. D. D. Smith for the salvation of the roots of the teeth by a systematic method of treatment, has directed our attention to the value of the roots of the teeth, so much so that their conservation is fast coming to be one of the greatest and best advances made in dentistry in the past decade. The wonder is that we have allowed the condition of the gums, brought about by deposits on the roots of the teeth, to become so universally diseased in many cases as to seriously threaten the loss of entire dentures, without becoming more concerned than we have been. A case came to our attention recently where several teeth had been lost, and the patient wished bridgework inserted to supply the lost teeth. An examination revealed the fact that practically every remaining tooth in the mouth was affected with pyorrhea, and most of them were so loose that the occlusion was fast shifting them to serious mal-occlusion. There was no visible deposit of consequence, but a care-

ful exploration disclosed pockets varying from one-third to two-thirds of the length of the roots. The patient had no knowledge of this condition and the dentist who expected to construct the bridgework seemed never to have suspected that there was anything to be done to prepare the mouth for bridgework. However skillfully bridgework may have been made for such a mouth, it must have proved an inevitable failure, and in a short time. Another case came under our care recently which seemed to require only a filling to place the mouth in good condition. A small deposit of calculus on the buccal surface of the upper first molar called for attention, which led to the fact that almost every tooth in the mouth had serious deposits secretly lodged under the gum and without producing a sign of irritation of the gum or any suppuration. Three sittings of an hour and a half each spent on that mouth were necessary to put the mouth in a wholesome condition. A few days only after the treatment showed such a marked improvement in the condition of the gums that the patient noticed it, and is delighted with the feeling of comfort he now enjoys. The gums have settled down close to the roots, and are hard and of a beautiful pink color, and the patient brushes his teeth with a good stiff brush as much as he likes with no discomfort.

In all patients, particularly in those past the age of thirty years, the roots of the teeth need constant supervision. While we are looking for cavities to fill and crowns and bridges to make, don't forget to carefully examine the root conditions. If the roots fail, what use will all our beautiful crowns and fillings be? The fact is, the props will have been knocked out, and the entire dental structure will fall as a mass of ruins. A new field of service is here opening that will require our highest skill to successfully meet, and heroic devotion to our professional instinct to take up, as it will require much tedious labor, and the remuneration may not always compensate. But we must do it.—*Dental Register.*

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PHARMACOPEAL PREPARATIONS. By Dr. A. H. Merritt, I would like to emphasize the importance of accuracy in our prescriptions and the use of pharmacopeal preparations in place of proprietary drugs. The preparations mentioned can be obtained any-

where, and at considerably less expense than the proprietary articles:

The first is *Liq. Antisepticus*.

Boric Acid .....	20.00
Benzoic Acid .....	1.00
Thymol .....	1.00
Eucalyptol .....	0.25
Oil Peppermint .....	0.50
Oil Gaultheria .....	0.25
Oil Thyme .....	0.10
Alcohol .....	250.00
Water, qs.....	1000.00

This makes a preparation slightly acid in reaction, it is pleasant to the taste and is a reasonably active germicide. It can be retailed with profit for about 50 cents for 16 ounces. Listerine, which it resembles, costs about 75 cents for 14 ounces. The patient has been saved expense and you have the added advantage of not using a proprietary article.

There are one or two other preparations to which I would like to call attention. The first of these is *Cataplasma Kaolini*. This is a preparation similar to *Antiphlogistine*, is designed for external application, can be obtained anywhere, and has the advantage of being a standard preparation.

If we are going to employ an analgesic, let us do so with a full knowledge of what we are prescribing, and not resort to the use of such proprietary preparations as *antikamnia*, *phenalgin*, *ammonol*, etc. A standard preparation of this nature can now be obtained known as *acetanilid compound powder*, containing acetanilid 70 parts, sodium bicarbonate 20 parts, caffeine citrate 10 parts. In its use one knows precisely what he is prescribing; the cost is about 35 cents per ounce instead of \$1, the cost of proprietary preparations of a similar nature.

*Acetphenetidin* is now the official name of phenacetin and should be employed in prescribing it. The patent on this drug expired about a year ago, at which time it was sold at wholesale for \$1 per ounce. It can now be obtained for less than half that amount.

In the new pharmacopoeia the patent tinctures are now 10 per cent. Tincture of aconite is now 10 per cent instead of 35 per cent.

If in writing a prescription one wants the 35 per cent, it must be specified.

It is incumbent upon us to employ standard preparations. Let us discourage the use of too many proprietary articles, which are more or less worthless, and impose not only extra expense upon our patients, but preparations which are often of inferior quality.—*The Journal (Dental Register)*.

ANESTHESIA WITH CHLOROFORM AT 38° C.—Having observed that in tropical countries chloroform induces anesthesia in a remarkably satisfactory way, the author undertook a series of experiments with chloroform kept at a temperature of 38° C. (100.4° F.) by immersing the chloroform container in warm water. The number of cases in which anesthesia was induced by means of chloroform at the temperature above given is as yet too low to warrant the author in reaching definite conclusions, but inasmuch as, in the seven cases tried, anesthesia was brought about more rapidly than ordinarily, the patients regained consciousness earlier, and no post-chloroform accidents occurred, I feel justified in suggesting that this method be given a more thorough trial.—DR. HAMM, *Dental Cosmos*.

[A heating attachment has been devised by Dr. Teter of Cleveland for warming nitrous oxid and oxygen in prolonged anesthesia with these gases. Warming the anesthetic agent certainly promises good results.—ED. DENTAL DIGEST.]

NOTES FOR USING SILICATE CEMENTS.—

Remember, this is a chemical porcelain, not an ordinary cement.

The retention is mostly mechanical.

Keep any form of grease from instruments during insertion.

Avoid use of hot paraffin.

Retain dryness at least thirty minutes.

Use only where properly indicated, and observe every detail, or else the result will be failure.

They are indicated especially in approximal cavities in anterior teeth (not corners), labial and buccal cavities, and in deep crown fissures in bicuspids and molars, especially in the permanent teeth of children.

When ready to insert filling be sure everything needed is at hand; you cannot safely stop during operation to hunt instruments.

If a receptacle for water is kept convenient to drop slab and spatula into immediately after mix is made, much trouble in cleansing can be avoided, as the remaining portion is disintegrated and can be taken off with a towel.

Beware of coarse strips and sand-paper disks in finishing; use fine ones, take more time and get better results.—J. P. Root, *Western Dental Journal*.

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## Editorial.

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### CHARACTER; A VALUABLE ASSET.

"Lives of great men all remind us we can make our lives sublime, and, departing, leave behind us footprints on the sands of time."

Since the publication of the last issue of the DIGEST a great man has passed away. With the idea in view of emphasizing the value of character, we desire at this time to direct attention to his life.

Every loyal American citizen, regardless of political faith, was deeply moved by the announcement of the death of our only living ex-President, Grover Cleveland. The American people have long since looked upon him as a man who, as Governor Hughes of New York said, "by his ruggedness, his courage, his tenacity and his devotion to his ideals of duty, did much to elevate the standards of public service."

The political integrity of this great man was not only beyond reproach, but above suspicion; in him his most merciless opponent would have smiled at the suggestion of dishonor or dishonesty. The records of his deeds and actions are familiar pages in American history. There was nothing which he did not dare to do, and what he did he did with all his might and energy. With his character shining as a beacon light on a foggy sea he stood at his post like a soldier, though often maligned and misrepresented, with no thought but the performance of his duty as he saw it and with little hope of reward, except that which came from his own conscience.

This trait of his character was exemplified during the great rail-

road strike of 1894, when, in the city of Chicago and adjacent towns, the riotous strikers were destroying property—nay, human lives—and when the Governor of Illinois refused to call out the State Militia, Mr. Cleveland averted a serious crisis by exercising the authority of the government promptly and decisively and turned a possible disastrous situation into a victory for law and order.

A few years ago, when the bloody deed of an assassin plunged our nation into deep mourning by the death of Mr. McKinley, another trait of the character of Cleveland was shown in an address which he delivered to the students of Princeton University. After referring to the assassination he said: "First in my thoughts are the lessons to be learned from the career of William McKinley by the young men who make up the student body of our university. These lessons are not obscure nor difficult. They teach the value of study and mental training, but they teach more impressively that the road to usefulness and to the only success worth having will be missed or lost except it is sought and kept by the light of those qualities of heart which it is sometimes supposed may be neglected or subordinated in university surroundings. This is a great mistake. Study and study hard, but never let the thought enter your mind that study alone or the greatest possible accumulation of learning alone will lead you to the heights of usefulness and success.

"The man who is universally mourned today achieved the highest distinction which his great country can confer on any man, and he lived a useful life. He was not deficient in education, but with all you will hear of his grand career and of his services to his country and his fellow citizens, you will not hear that either the high place which he reached or what he accomplished was due entirely to his education. You will, instead, constantly hear as accounting for his great success that he was obedient and affectionate as a son, patriotic and faithful as a soldier, honest and upright as a citizen, tender and devoted as a husband, and truthful, generous, unselfish, moral and clean in every relation of life."

These words could fittingly be used in eulogizing the dead ex-President. Mr. Cleveland was a good President, an eminently broad-minded and wholesome American citizen who lived long enough to die honored and respected by even his former enemies.

The memorials of such men are among the best assets of a nation. His career is an inspiring chapter, and his sterling character affords valuable lessons for young men, whether engaged in the professions or other walks of life. It teaches us, by force of integrity, devotion to duty, courage and tireless industry, men can succeed. In the language of Mr. Cleveland, let us "study and study hard, but never let the thought enter our minds that study alone or the greatest possible accumulation of learning alone will lead us to the heights of usefulness and honor."

J. P. B.

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#### A SERIES OF PRACTICAL ARTICLES.

In the March (1908) number of the DIGEST we published an article from the pen of Dr. J. V. Conzett on "Gold Fillings." The author received numerous letters from our readers asking how these fillings could be made. In reply to the many queries, Dr. Conzett has kindly consented to write a series of practical papers on "How to Make Gold Fillings." The articles will be published serially in the DIGEST each month, beginning in this issue.

There have been few periods of time when the publication of such a series of articles, as the author contemplates writing, would have done more good than they will in this advanced age of dental practice. We, therefore, feel grateful to our readers for urging the necessity of these articles and thankful to Dr. Conzett for consenting to write them.

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Several of our readers have been thoughtful enough to send in practical hints, etc., for publication in the News Summary department of our journal. These are always appreciated and the editor desires to take this means of thanking them for their kindness and asking for a continuance of the same along this line. As the DIGEST appears the last of the month instead of the first, all such matters should be in the hands of the editor by the first of the month to insure publication in current issue of the journal.

## Obituary.

W. T. PENNY, 70 years old, a dentist of Abbeville, S. C., died June 22, 1908.

J. E. DAVIS, 54 years old, a well-known dentist of Columbus, S. C., died May 31, 1908.

CHARLES C. WHISTLER, 32 years old, a dentist of Ashland, Neb., was drowned June 8, 1908.

C. CAMPBELL GLEASON, a prominent dentist of New York City, died suddenly in London at a recent date.

R. A. GARDNER, 46 years old, one of the leading dentists of Quincy, Ill., died from heart failure, June 7, 1908.

HERMAN F. HORMANN, a dentist of Haddon Heights, Pa., was drowned by the capsizing of a canoe, June 19, 1908.

WILLIAM J. ADDENBROOKE, 44 years old, a dentist of Milwaukee, Wis., died, after a two years' illness, June 12, 1908.

D. J. BRIGHAM, 68 years old, a well-known dentist of Boston and Dorchester, died from heart failure, June 20, 1908.

WILLIAM B. MCCHESNEY, 69 years old, a practicing dentist of Chicago for thirty-eight years, died from stomach trouble, June 29, 1908.

## Notices.

### FIRST DISTRICT DENTAL SOCIETY OF ILLINOIS.

The First District Society of Illinois will hold its annual meeting in Peoria, September 29 and 30, 1908.

H. W. McMILLAN, D.D.S., Secretary,  
Roseville, Ill.

### WASHINGTON STATE DENTAL SOCIETY.

The twenty-first annual meeting of the Washington State Dental Society was held in Spokane, June 25, 26 and 27, 1908, and officers for the ensuing year were elected as follows: President, George T. Williams, Seattle; Vice-President, F. L. Moak, Montesano.

### HARVARD DENTAL ALUMNI ASSOCIATION.

At the thirty-seventh annual meeting of the Harvard Dental Alumni Association, held in Boston, June 22, 1908, the following officers were elected for the ensuing year: President, Lyman F. Bigelow, '86, Boston; Secretary, Waldo E. Boardman, '86, Boston; Treasurer, Harold De W. Cross, '96, Boston. Executive Committee—Waldo E. Boardman, '86, chairman ex-officio, Boston; David F. Spinney, '00, Brookline, term expires 1909; Charles E. Parkhurst, '97, Somerville, term expires 1910. Trustees of Life Membership Fund—H. De W. Cross, '96, Treasurer ex-officio,

Boston; Joseph L. Paul, '91, Boston, term expires 1909; Frank T. Taylor, '90, Boston, term expires 1911. Committee on Nomination and Election of Officers for 1909—Robert T. Moffatt, '95, Boston; George H. Wright, '03, Boston; Arthur J. Oldham, '90, Boston.

WALDO E. BOARDMAN, D.M.D., Secretary,  
419 Boylston St., Boston, Mass.

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#### COLORADO STATE DENTAL ASSOCIATION.

The twenty-second annual meeting of the Colorado State Dental Association was held in Boulder, June 18, 19 and 20, 1908, and officers for the ensuing year were elected as follows: President, I. C. Brownlie, Denver; Vice-President, William A. Smedley, Denver; Secretary, Charles A. Monroe, Boulder; Treasurer, W. A. Brierley, Denver. The next meeting will be held in Colorado Springs.

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#### CALIFORNIA STATE DENTAL ASSOCIATION.

At the annual meeting of the California State Dental Association, held at San Francisco, June 9, 10 and 11, 1908, the following officers were elected: President, O. P. Roller, Los Angeles; Vice-President, H. L. Seager, San Francisco; Secretary, C. E. Post, San Francisco; Treasurer, T. N. Iglehart, San Francisco.

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#### TEXAS DENTAL ASSOCIATION.

The twenty-eighth annual meeting of the Texas Dental Association was held in Dallas, June 11, 12 and 13, 1908, and officers for the ensuing year were elected as follows: President, J. W. Collier, San Antonio; 1st Vice-President, Julian Smith, Austin; 2d Vice-President, J. M. Nash, Brenham; Secretary-Treasurer, J. F. Fyfe, Dallas.

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#### PENNSYLVANIA STATE DENTAL SOCIETY.

The fortieth annual meeting of the Pennsylvania State Dental Society was held in Philadelphia, June 30 to July 2, 1908, and officers for the ensuing year were elected as follows: President, C. B. Bratt, Pittsburg; 1st Vice-President, W. D. DeLong, Reading; 2d Vice-President, C. C. Walker, Williamsport; Recording Secretary, L. M. Weaver, Philadelphia; Corresponding Secretary, V. S. Jones, Bethlehem; Treasurer, W. A. Spencer, Carbondale.

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#### MASSACHUSETTS DENTAL SOCIETY.

The forty-fourth annual meeting of the Massachusetts Dental Society was held in Boston, June 3, 1908, and officers for the ensuing year were elected as follows: President, N. A. Stanley, New Bedford; 1st Vice-President, C. S. Hurlburt, Springfield; 2d Vice-President, Eugene H. Smith, Boston; Secretary, Charles W. Rodgers, Dorchester; Assistant Secretary, C. Edson Abbott, Franklin; Treasurer, Joseph E. Paul, Boston;

Editor, Carl R. Lindstrom, Boston. The next meeting will be held in Boston.

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#### OREGON STATE DENTAL ASSOCIATION.

The fifteenth annual meeting of the Oregon State Dental Association was held in Portland, June 15, 16 and 17, 1908, and officers for the ensuing year were elected as follows: President, A. L. Beatie, Oregon City; Vice-President, W. C. Harris, Eugene; Secretary-Treasurer, M. C. Holbrooke, Portland.

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#### CONNECTICUT ODONTOLOGICAL ASSOCIATION.

The eighth annual meeting of the Connecticut Odontological Association was held in Bridgeport, June 17, 1908, and officers for the ensuing year were elected as follows: President, L. D. Monks, New Haven; Vice-President, C. A. Ryder, Bridgeport; Secretary, George H. Neubauer, Bridgeport; Treasurer, F. L. Uhle, Bridgeport.

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#### MINNESOTA STATE DENTAL ASSOCIATION.

The twenty-fifth annual meeting of the Minnesota State Dental Association was held in St. Paul, June 8, 9 and 10, 1908, and officers for the ensuing year were elected as follows: President, H. B. Kramer, Minneapolis; Vice-President, A. W. Gallagher, Winona; Secretary, F. E. Cobb, Minneapolis; Treasurer, C. H. Robinson, Wabasha.

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#### MAINE DENTAL SOCIETY.

The forty-third annual meeting of the Maine Dental Society was held in Lewiston, July 1, 2 and 3, 1908, and officers for the ensuing year were elected as follows: President, W. R. Bibber, Eastport; Vice-President, F. H. Mead, Bangor; Secretary, H. A. Kelley, Portland; Treasurer, E. J. Roberts, Augusta. The next meeting will be held in Portland.

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#### UTAH DENTAL ASSOCIATION.

The eighteenth annual meeting of the Utah Dental Association was held in Ogden, June 5 and 6, 1908, and officers for the ensuing year were elected as follows: President, K. Weber, Salt Lake City; 1st Vice-President, O. H. Budge, Logan; 2d Vice-President, C. W. Gates, Salt Lake City; Secretary-Treasurer H. T. Emeis, Logan. The next meeting will be held in Logan.

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#### SOUTH CAROLINA STATE DENTAL ASSOCIATION.

The thirty-eighth annual meeting of the South Carolina State Dental Association was held in Columbia, June 9, 10 and 11, 1908, and officers for the ensuing year were elected as follows: President, E. J. Etheridge, Leesville; 1st Vice-President, E. N. Kibler, Prosperity; 2d Vice-President, W. W. Chisholm, Anderson; Corresponding Secretary, R. H. Shealey,

Lexington; Recording Secretary, R. Atmar Smith, Charleston; Treasurer, W. S. Brown, Charleston.

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#### OKLAHOMA STATE DENTAL ASSOCIATION.

The first annual meeting of the Oklahoma State Dental Association was held in Muskogee, June 8, 9 and 10, 1908, and officers for the ensuing year were elected as follows: President, W. A. Walters, Checotah; 1st Vice-President, C. G. Wallace, Shawnee; 2d Vice-President, N. C. Wood, Armore; Secretary, E. P. Ryan, Muskogee; Treasurer, L. G. Mitchell, Oklahoma City. The next meeting will be held in Oklahoma City.

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#### GEORGIA DENTAL SOCIETY.

The fortieth annual meeting of the Georgia Dental Society was held in Augusta, June 2, 3 and 4, 1908, and officers for the ensuing year were elected as follows: President, C. P. Davis, Americus; 1st Vice-President, W. C. Miller, Augusta; 2d Vice-President, George S. Tigner, Atlanta; Corresponding Secretary, D. H. McNeil, Athens; Recording Secretary, DeLos L. Hill, Atlanta; Treasurer, H. R. Jewett, Atlanta.

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#### SOUTHERN CALIFORNIA DENTAL ASSOCIATION.

The eleventh annual meeting of the Southern California Dental Association was held in Los Angeles, June 1, 2 and 3, 1908, and officers for the ensuing year were elected as follows: President, Charles M. Benbrook, Los Angeles; 1st Vice-President, J. E. MacMillan, Pasadena; 2d Vice-President, J. Ronna, San Bernardino; Secretary, Charles E. Rice, Los Angeles; Treasurer, Kate Buck, Los Angeles. The next meeting will be held in Los Angeles.

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#### SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The annual meeting of the Southern Wisconsin Dental Association was held at Platteville, Wis., May 27, 28, 1908, and the following officers were elected for the ensuing year: President, J. H. Reed; First Vice-President, G. E. Cleophas; Second Vice-President, S. H. Chase; Secretary, C. W. Collver; Treasurer, W. G. Hales. The meeting of 1909 will be held at Beloit, Wis.

C. W. COLLVER, D.D.S., Secretary,  
Clinton, Wis

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#### MISSOURI STATE DENTAL ASSOCIATION.

The forty-third annual meeting of the Missouri State Dental Association was held in St. Louis, June 1, 2 and 3, 1908, and officers for the ensuing year were elected as follows: President, J. B. McBride, Springfield; 1st Vice-President, R. E. Darby, Springfield; 2d Vice-President, E. P. Dameron, St. Louis; Recording Secretary, H. H. Sullivan, Kansas City; Cor-

responding Secretary, J. F. Wallace, Canton; Treasurer, J. T. Fry, Mo-  
berly. The next meeting will be held in Kansas City.

J. F. WALLACE, D.D.S., Cor. Secy.,  
Canton, Mo.

#### NATIONAL DENTAL ASSOCIATION.

At the forthcoming meeting of the National Dental Association, to be held at Boston, Mass., July 28, 29, 30 and 31, 1908, the presentation of the following papers, in their respective sections, has been arranged:

##### Section 1.

Dr. H. A. Pullen, Buffalo, N. Y.—"Orthodontia."

Dr. Geo. H. Wilson, Cleveland, O.—"Some phases in the construction of complete vulcanite dentures" (exhibiting 30 to 40 slides, showing appliances and points in construction).

Dr. Charles Channing Allen, Kansas City, Mo.—"Metallurgy."

##### Section 2.

Dr. Burton Lee Thorpe, St. Louis, Mo.—"The contributions of New England dentists."

Dr. Geo. W. Weld, New York City—"Characteristics of calcified tissues in two complete sets of human teeth, free from caries."

Dr. Joseph Head, Philadelphia, Pa.—"The protecting action of saliva from decalcification of enamel by acids."

Additions to the clinic program have been made as follows:

#### CHAIR CLINICS.

F. S. Belyea, D.D.S., Brookline, Mass.:

Tin and gold fillings.

Bliven, C. Frank, D.D.S., Worcester, Mass.:

Contour operation with cohesive gold on mesial surface of first molar.

Brigham, W. H., D.D.S., South Framingham, Mass.:

(a) Anchored porcelain in an incisor.

(b) Burnished gold filling in distal of upper cuspid.

Eames, George F., D.D.S., Boston, Mass.:

Pyorrhea.

Prentiss, C. C., D.D.S., Hartford, Conn.:

To be announced.

Weeks, Thomas E., D.D.S., New York City:

Currents in children's teeth.

#### TABLE CLINICS.

Belyea, F. S., D.D.S., Brookline, Mass.:

Artistic arrangement of artificial teeth and plumpers.

Campbell, Dayton D., D.D.S., Kansas City, Mo.:

Campbell method of casting dentures.

Crews, J. T., D.D.S., Jackson, Tenn.:

Protrusion of lower jaw, reduced to occlusion with hood and pressure on point of chin.

Davis, Clyde, D.D.S., Lincoln, Neb.:

Original method of constructing veneer inlays applicable to the same cavity preparation as for foil or amalgam fillings.

Dunwoody, J. E., D.D.S., West Philadelphia, Pa.:

Different uses of the casting machine.

Howe, Horace L., D.D.S., Boston, Mass.:

Orthodontia.

Lett, Isadore, D.D.S., Boston, Mass.:

To be announced.

Sykora, R., D.D.S., Boston, Mass.:

Orthodontia hinge.

Tracy, William D., D.D.S., New York City:

Gold inlays.

Watkins, C. G. S., D.D.S., Montclair, N. J.:

A demonstration in dental prothesis, demonstrating the taking of impressions, the application of tinfoil in vulcanite work and the arrangement of artificial teeth to imitate nature.

This will make a total of one hundred and sixty operations upon both days. These have been divided for convenience and will be given upon the mornings of July 29 and 30 at the Tufts College Dental School. The college faculty have generously offered the dental infirmary for clinics. This room occupies the first floor of the dental wing and is fully equipped with aseptic chairs, cuspids and brackets. Steam sterilizers are provided for the disinfection of instruments. It is one of the most complete dental infirmaries in this country. Everything will be in readiness at 9 a. m.

After this hour, members of this association and the visiting profession will find the clinic room alive with wide-awake men, demonstrating, at the chair and table, operations in gold, silicate and metal fillings, porcelain and gold inlays, jacket crowns, orthodontia and prosthetics.

Dr. C. H. Land of Detroit, Mich., one of the pioneers in porcelain work, will clinic upon the artificial enameling of vital teeth. Dr. Land expects to be in Boston several days previous to the meeting, and will carefully prepare the best cases, to complete upon the clinic days.

Drs. Horace I. Beemer and V. M. Rundle, from New Jersey, will operate upon the same patient, using Dr. Black's method. The first day Dr. Rundle will make filling in mesial surface of upper bicuspid. Upon its completion Dr. Beemer will make the operation in distal surface of upper first bicuspid. Dr. J. V. Conzett of Dubuque, Iowa, also skilled in Dr. Black's method, will give an operation in gold filling. This will give the eastern profession an opportunity of seeing methods which the men of the Northwest have so enthusiastically adopted. Dr. J. B. Rideout of St. Paul,

Minn., will make it interesting by casting inlays, crowns, bridges and a few novelties on both days. These are a few of the many interesting clinics in store for those who visit the Dental Infirmary upon Wednesday and Thursday mornings.

There is an interesting variety of surgical clinics scheduled for both days in the infirmary of the college. Upon the morning of each day, Prof. Wm. E. Chemery of Boston will give a fifteen-minute lecture upon adenoids in the amphitheater at 10:45, illustrated with the projection apparatus. This will be followed by operations in the infirmary. This cannot fail to interest those in attendance, which also might be said of all the prospective surgical operations.

The laboratory exhibitions to be given by three of the Tufts College professors, in their own laboratories, present a unique grouping of demonstrations. Prof. G. V. N. Dearborn will take "Normal Vital Functions" for his subject, using the frog, chameleon, and tortoise in illustrating the vital movements. Dr. H. Carlton Smith, professor of chemistry of Harvard, will give us the benefit of his untiring analyses of saliva. The third laboratory exhibit will combine the scientific knowledge of Profs. G. A. Bates and Timothy Leary upon bacteria in the mouth, and the lesions arising therefrom.

As a whole, the program arranged is full of interest from beginning to end. The committee would gladly have had every professional man with something of interest to demonstrate, upon the program, but when they must reach a membership so widely scattered, not all the best men are available or known.

They wish to extend a "thank you" to all who have responded, also for the many expressions of good-will which have accompanied the letters received. They also desire to thank the editors of the different journals for their assistance in reporting the progress of the committee.

A favor is asked of the clinicians—that each one shall mail or bring to the meeting a synopsis of his clinic. This will greatly aid the committee in arranging reports of clinics for publication in the transactions of the meeting.

This finishes the report of the clinics up to date. Whatever changes or additions to the program are now made, will appear upon the final program of the meetings.

#### RAILWAY RATES.

New England Association, which includes the territory of New England, grants a rate of a fare and one-third on certificate plan. Trunk Line Association, which includes the territory of Buffalo, Niagara Falls, N. Y., Erie and Pittsburg, Pa., Bellaire, O., Wheeling, Parkersburg and Huntington, W. Va., and points east thereof, except New England, a rate of one and three-fifths, also on certificate plan. All other territory grants summer tourist rates in existence and effective to Boston during the summer. Those using the Trunk Line rates will deposit their certificate.

together with 25 cents, with the Secretary, Dr. C. S. Butler, immediately on arriving at the meeting.

GEORGE E. SAVAGE, Chairman, Clinic Section,  
Boston, Mass.

CHAS. S. BUTLER, Rec. Secy.,  
Buffalo, N. Y.

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#### LATEST DENTAL PATENTS.

888,455. Dental plunger, A. Atkiss and D. C. Carson, Philadelphia, Pa.  
888,484. Mouth prop, J. L. Gehorsam, New York, N. Y.  
889,002. Dental cement and manufacturing the same, F. L. and G. L. Grier, Milford, Del.  
889,085. Dental swaging apparatus, H. W. Allwine, Omaha, Neb.  
890,143. Brush for cleaning artificial sets of teeth, E. Kuzzer, Dresden, Germany.  
890,913. Amalgam press, A. J. Leveque, Lead, S. D.

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### News Summary.

Many of our readers, from time to time, have been thoughtful enough to send in items for publication in this department of the journal. These are always appreciated and the editor desires to take this means of thanking them for their kindness, and asking for a continuance of the same along this line. The special items are selected with a great deal of care, thus this department has always been an attractive feature. As the DIGEST appears the last of the month instead of the first, all such matters should be in the hands of the editor by the first of the month to insure publication in current issue of the journal.

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SUICIDES.—W. H. Craig, 57 years old, for more than thirty years a dentist of Oakland, Cal., committed suicide by shooting June 4, 1908.—W. T. Fisher, 50 years old, a widely known dentist of Shelbyville, Tenn., committed suicide by shooting himself through the heart, June 1, 1908.

DENTAL FEES.—Regarding the matter of fees I do not believe in exacting three times as much from one because he has made his money from speculation. If we have grown into a wealthy practice our fees should be increased, but without making the successful speculator pay for something that we have done for someone else. Have a maximum fee. Charge that to the rich man, and then if we wish to make a deduction to one less fortunate financially all right, but don't charge the speculator

three or four times as much as our maximum to make up for it. If we wish to do charity work do it, but we should not make someone else pay our gratuities.—T. L. GILMER, *Dental Review*.

COLLEGE COMMENCEMENTS.—College of Dentistry, University of Southern California, June 11, 32 graduates; Tufts Dental College, June 17, 87 graduates; Creighton Dental College, May 27, 36 graduates; George Washington University, June 3, 17 graduates; University of Michigan, June 18, 55 graduates.

FIRES.—Dr. W. H. Brown, Huntington, Ark., June 11; loss \$150.—Dr. Dye, Mansfield, Ill., June 6; loss \$700.—Dr. Harry Eckles, Dallas, Tex., June 24; loss \$4,000, some insurance.—Union Dental Parlors, Pittsburgh, Pa., June 13; loss about \$500.—Dr. A. Wolfson, New York, June 3; considerable damage, insurance \$2,000.

MEMORIAL TABLET FOR THE LATE DR. CHARLES C. CHITTENDEN.—The memorial tablet of the Wisconsin State Dental Society to Dr. Charles C. Chittenden was placed in Grace Episcopal church, at Madison, Wis., on Monday, July 20, 1908. Several dentists attended the ceremony while on their way to the state meeting at La Crosse.

TO COLLECT SPILLED MERCURY.—Roll a clean piece of tin foil tightly to the size of the lead in a pencil. Touch the scattered globules of mercury with the end of the roll, thus gathering as much mercury as it will carry. Squeeze the collected mercury into a suitable receptacle, much as you would amalgam.—GEORGE McCANN, *Pacific Gazette*.

ASKS ARMY RANK FOR DENTISTS.—The house of delegates of the American Medical Association instructed its legislative committee, at its recent meeting in Chicago, to assist in securing the passage of a law by congress, putting the dental corps of the army and navy on such a basis that the dentists shall rank as commissioned officers.—Chicago *Daily News*.

TWO CASES OF ACTINOMYCOSIS.—Dr. M. C. Smith of Lynn, Mass., reports two cases of actinomycosis, both of the upper jaw. He had some difficulty in convincing the medical and dental profession of the soundness of his diagnoses, but these were confirmed by the State Board of Health and also by the bacteriologist of Tuft's Dental School, Boston. Both cases are doing well.

ACCESSIBILITY AS A GUIDE IN RESTORATION.—In many instances accessibility must be the guide whether we are to make a gold filling or an inlay, and it is something in which the personal equation enters very largely. Cavities that are accessible to one operator are not so to another, and as a man's skill increases he will find himself making operations in locations which would have been impossible for him to make a year or two before. The size of the opening of the mouth, the flexibility of the lips and the position of the teeth in the jaws should all be considered.

If the cavity can not be made so that every part of it may be reached and the correct line of force applied to the gold foil, do not make a foil filling, make an inlay.—C. E. WOODBURY, *Dental Review*.

THE MAN WHO READS.—The man who reads is the man who knows, and the man who knows is the man who succeeds. The man who reads, who reads the right books and studies them rightly, and who then puts into practical, everyday use the knowledge gleaned from thorough "every night" study, is the man who is on the sure road to success.—Editorial, *Modern Machinery*, (*Dental Brief*).

VIVISECTION.—The following illustrations of the fundamental importance of vivisection to mankind have recently been set forth: The saving of little children from death by diphtheria and from idiocy of cretinism; the discovery of aseptic surgery; the proving of the germ origins of tuberculosis and typhoid fever, and, as a result, of methods of prevention; our knowledge of the infection of bubonic plague; the recently devised serum treatment of cerebro-spinal-meningitis.—*Medical Times*.

ANTISEPTIC SPRAY FOR TEETH AND GUMS.—In cleaning teeth I frequently follow the stick and ribbon floss with the brush wheel used upon the coronal surfaces. After this is all done, I use an antiseptic spray under a pressure of thirty pounds, and go all over the teeth, between them, and especially under the gum margin, to thoroughly wash out any debris that may be left. The spray that I use is echefolta, 1 ounce; dioxogen, 5 ounces and water 4 ounces.—J. V. CONZETT, *Dental Review*.

DEATHS FROM ANESTHETICS.—A question recently put to the Secretary of State for the Home Department as to how many deaths occurred during the year 1907 in the metropolitan area and in the other parts of England and Wales, respectively, from the effects of the administration of anesthetics elicited the reply that the figures for the year 1907 were not yet available, but according to the verdicts of coroners' juries and the certificates of medical practitioners there were in the year 1906 sixty-four deaths in London and 119 in the remainder of England and Wales caused by anesthetics administered for operations.—*British Medical Journal* (*Dental Brief*).

ROBBERIES.—Dr. Smith, San Bernardino, Cal., considerable gold, June 9.—Dr. E. Smith, La Salle, Ill., gold valued at \$200, June 16.—Dr. A. B. McVay, Streator, Ill., material valued at \$200, July 17.—Drs. W. J. Morgan and C. J. Fawkes, Mineral Point, Wis., gold and other material valued at \$40 and \$60, respectively June 18.—Dr. Richard Morris, Evansville, Ind., gold fillings, bridges and solder, valued at \$30, June 13—Dr. W. E. Blackburn, Shelbyville, Ind., gold valued at \$75, June 1.—Dr. George Menges, Elkhart, Ind., goods valued at \$25, July 2.—Drs. Anna Cluthe and the Crescent Dental Company, Evansville, Ind., gold and materials valued at \$150 and \$50, respectively, June 13.—Drs. Chemoweth & Dykeman, Richmond, Ind., gold valued at \$125, June 27.—Drs. Phillips and Warvel,

Anderson, Ind., materials valued at \$25 and \$50 respectively, June 20.—Dr. H. H. Lane, Kenosha, Wis., gold valued at \$20, May 29.—Drs. Meyers and Cleophas, Beloit, Wis., teeth and gold valued at \$225, June 9.—Dr. M. J. Newman, Montillo, Wis., gold valued at \$60, June 12.

**CARE OF NICKEL-PLATED PARTS.**—One of the best methods known for keeping bright the nickel work about the office is to wet a rag with a solution of sodium hypophosphate and wipe the article with it, drying it with a soft towel and then rubbing with a piece of chamois.—*Bulletin*.

**IN USING FLUX FOR SOLDERING.**—When case is cold apply the solution; after it is heated and you need more, use the powder. A good liquid flux is made by preparing a saturated solution of pure powdered borax in one bottle, and in another bottle a saturated solution of boracic acid. Take equal parts of these two solutions and place in a convenient receptacle for use in all work where a liquid flux is desired.—H. H. SULLIVAN, *Western Dental Journal*.

**TREATMENT OF THE SYSTEM IN ALVEOLAR ABSCESS.**—In dealing with alveolar abscess it should be remembered that we have to treat a part of the general system, and while it is positively essential to a cure that the local needs should be met, it is also well to look to the general condition of the patient, and administer proper treatment according to the indications of the case. Pus formation usually shows itself by a rise in temperature, and the use of a clinical thermometer should be encouraged.—CHARLES P. PRUYN, *Dental Review*.

**AMERICAN DENTIST FIXING ROYAL TEETH.**—Dr. A. T. Webb, an American living in Rome, bids fair to become as well known in Italy as his colleague, the late Dr. Evans, was in France. Dr. Webb is Queen Helena's dentist and keeps the pretty pearls in her daughter's mouth in order. He has even had a glimpse at King Victor's molars when they ached hard. Now he has gone to Montenegro to put the teeth of the whole princely family there in order, beginning with Uncle Nicholas and ending with his little grandchildren.—*Chicago Tribune*.

**GOLD INLAYS WITH DOWELS.**—There is no question but that dowels, properly placed, give to gold inlays the maximum of retention with the least removal of useful tooth tissue and the least impairment of tooth strength. Under favorable conditions they are readily made part of the model or the matrix in cast or built up inlays. Now and again, however, this cannot be done; neither the wax model nor the matrix has sufficient rigidity to be withdrawn from the cavity with dowels in place without distortion. In such cases make the inlay without dowels, and after it is fitted, and while firmly held in position, drill through the inlay and into the tooth a hole to receive the dowel, selecting a drill that will ensure a tight fit for the dowel. After the position and direction of the hole in the tooth is well marked, the inlay may be removed, and with a little larger drill the hole continued into the tooth as far as deemed

proper. Then replace the inlay and force the dowel into position; if the work has been skilfully done, usually, the inlay and dowel may be removed without risk of displacement, and soldered. When this cannot be done fit the dowel, and immediately after cementing the inlay in place, and while the cement is still plastic, force the dowel into position, trusting to a tight fit through the inlay to hold it secure. When more than one dowel is needed it is safest to fit and to solder them one at a time.—*Pacific Dental Gazette*.

REPORT MANY DEFECTIVE PUPILS IN CHICAGO SCHOOLS.—Latest returns received by the health department from physicians who are examining the school children bear out the first reports that a remarkably large number of children are defective in vision, hearing, teeth, etc. Eighty-nine out of 162 examined are in urgent need of treatment, and others are defective, but not in need of medical attention. The chief trouble with forty-four of the pupils is enlarged tonsils, forty-two have bad teeth and thirty-six poor eyes.—*Chicago Record-Herald*.

INFECTION FROM CARIOUS TEETH.—The observations that I have made lead me to consider that the bacteria that are constantly present in badly decayed teeth are of an extreme virulent nature; especially is that true of the bacillus dentalis, the streptococcus and staphylococcus. In carrying on experimental work I have attempted to determine what agent could be introduced as a disinfectant in the cases in which infection has been introduced. Among a large number of agents that are classed as antisepsics and disinfectants I have come to look upon chinosol as first in the list to be introduced into the tissues if accidental inoculation should occur. Tricresol (at the present called cresol), is the next agent in efficiency. But it is important that these agents should be introduced immediately or as soon as possible after the accidental inoculation.—GEORGE W. COOK, *Dental Review*.

WHY PHYSICIANS ARE SHORT-LIVER.—Laymen were naturally surprised. Their view presumably is that the days of doctors should be longer in the land than those of other people because they know better than their patients what to "take" when they feel indisposed or are in the way of infection. Longevity, however, depends far more upon the manner of a man's life than upon the drugs which he swallows; and it is the doctor's misfortune that the exigencies of his calling often make it impossible for him to practice the hygienic doctrines which he preaches. *Obsta principiis* is one sound maxim on which it is specially hard for him to act. He can not afford to lay up and nurse himself for trivial ailments, but must often be out attending to his patients in spite of a general feeling of malaise. His night's rest may often be broken, though he knows that seven hours' sleep is the ideal. He may have to take his meals irregularly, though he is well aware of the virtue of regular habits, or to rush out to an urgent case in the middle of his dinner, though he is always warning his patients that that way lies indigestion. Moreover—

if he is a general practitioner—those long holidays which he is fond of proclaiming to be essential are very seldom for him. All these disadvantages count for more in the long run than his acquaintance with the quickest means of relieving a headache or soothing a catarrh; and the sum of the whole matter seems to be that the doctor who made his own health his chief concern would have to retire from practise in order to attend to it.—*American Medicine*.

**A VARNISH FOR IMPRESSIONS.**—A saturated solution of sodium silicate and ammonium hydroxid, equal parts, forms a varnish that is indispensable for plaster molds, impressions, etc., and is inexpensive. For impressions—apply in the same manner as you would shellac. A coloring matter, as carmine, may be added so that the division line may be readily seen. Separate in the same manner as with shellac. When used on models in flask before packing the rubber the plaster readily separates from the plate after vulcanizing, leaving it clean and smooth.—T. A. LEACH, *Dental Review*.

**TREATMENT OF ACUTE ABSCESS.**—In the treatment of acute cases of alveolar abscess, I wish to emphasize the desirability of making an early incision in order to avoid the stripping of the periosteum from the bone. The pus readily penetrates the bond around the apex of the root until it comes to the periosteum. Sometimes it will not readily get through the periosteum, but will strip the periosteum away from the bone, and if it remains in that condition very long, we may have necrosis of the bone as the result. For that reason, we should lance an acute abscess early, and we should be sure that the knife goes through the periosteum to the bone, scraping the bone with the end of the knife. If we do not get pus, the opening should be packed and kept open, so that any pus which forms may escape, and the patient will be relieved of pain much earlier.—A. D. BLACK, *Dental Review*.

**DENTIST EXTRACTS HIS WORK AND IS HALED INTO COURT.**—Accused by Miss Grace Ayer, a well-to-do young woman living at the Bryn Mawr apartments, New York, of forcibly extracting three crowns from her teeth while he was laboring under the belief that she had given him a worthless check, a dentist was arraigned before Magistrate Wahle in the Jefferson Market Court today. After the girl had recited the circumstances attending the loss of the gold tops of her molars the dentist was held in \$300 for appearance in the Special Sessions Court.

Miss Ayer had had considerable work done, and for this she said she had paid from time to time with checks. Later she received word to call upon the dentist. He met her cordially, she says, and bade her be seated in his chair, so that he might inspect the condition of the work that had been done.

"No sooner had I opened my mouth," she told the magistrate, "than he ripped off the three crowns without a word. When I demanded an

explanation he very brusquely told me that I had given him a bad check and that this was his method of dealing with such cases." It was shown that the check was good.—*Chicago Record-Herald*.

**CASTING GOLD ON FACINGS.**—To avoid checking facings in casting, do not let any wax extend over labial surface, as the gold will cause a check while cooling. One other cause is, that the facing is not hot enough to receive the liquid gold. To overcome this difficulty, back up the facings with thin gold before applying the wax. The liquid gold is then not forced against the porcelain but against the backing. The facing should be invested close to bottom of flask, so it can be heated very hot. These points, observed, will save much of checking.—W. O. FELLMAN, Oak Park, Ill.

**SYMPTOMS OF A HEALTHY PULP.**—There is one symptom on which I rely as to whether a pulp is alive or dead. If I can get healthy sensation when I am excavating the dentin I place a good deal of reliance on it. If I do not get that, then I begin to get suspicious; I go further, but I become more cautious. But if I get healthy sensation between the enamel and dentin, I have reason to believe that the pulp is healthy. If I do not get that sensation I will apply heat, and if I get an uncomfortable sensation from the heat I conclude there is gas there and it has expanded.—J. N. CROUSE, *Dental Review*.

**GASOLINE.**—For cleaning and sterilizing instruments I keep a glass-stoppered jar full of gasoline. It will destroy absolutely any animal immersed in it from a microbe to an elephant. It keeps steel instruments bright and free from rust.

It is cheap, ready for instant use at all times, and gives one a sense of security in its use that is a constant source of joy.

In operating in particularly unsavory mouths I never let an instrument touch the bracket until I have dipped and polished it with a dry towel. I would then be willing to have it used in my own mouth.

It will clean your oilstones, wash basin, machinery, linoleum, woodwork, light your office, do your furnace and blowpipe work, vulcanize, cook your meals and carry you to and from your office in a trice.—*Pacific Dental Gazette*.

**GUTTAPERCHA FOR ROOT FILLING AND SETTING CROWNS AND BRIDGES.**—The septic contents of the tubuli of a diseased root must be brought into aseptic condition, but not alone that; the root must be so completely disinfected that when its point is closed and the crown or bridge set infection cannot supervene. In such a case guttapercha is not admissible. To remain in a healthy condition such a root must be not only hermetically sealed at the foramen, but it must have its pivot so completely sealed that there can be no ingress of corrupting microorganisms. In a healthy root, where a crown has been set with a thin layer of guttapercha, a slight leakage is a factor of little moment; but in a root which has been saved, as by fire, not only the danger of fracture through swelling of the material may exist, for moisture causes in time all guttapercha to swell, but it is also impossible

to keep any root free from the ingress of moisture except with cement, and also in desperate cases the strength imparted by cement is a factor of great importance.—N. S. JENKINS, *Dental Summary*.

**FATALITIES.**—Mrs. Anna Balduff, of Saginaw, Mich., died June 4, from heart failure, following an operation for the extraction of several teeth.—Mrs. Franklin H. Lafferty of Pottstown, Pa., died July 2, following the extraction of a tooth to relieve an abscess. Unable to discharge the flow of pus that followed the operation, Mrs. Lafferty gradually grew weaker and strangled to death.—Unable to face the operation of having a tooth extracted, Mrs. Muenster of Dallas, Tex., convulsed and died in a dental chair July 4. Heart disease and the extremely nervous condition she was in are said to have been the causes of her death.

**PHENOL SULFONIC ACID, A STIMULATING CAUSTIC.**—Take phenol, 95 per cent., one drachm, and one drachm chemically pure sulphuric acid. Heat the phenol in a test tube or evaporating dish nearly to boiling, then, while hot, gradually add sulphuric acid, and while this solution is still hot gradually add two drachms of water. This is used in 25 per cent solution for treating pyorrhea and in chronic alveolar abscesses. If used 50 per cent or full strength in pulp canals it should be on threads of silk or asbestos, not cotton, as this would be quickly destroyed. It is not severely caustic.—J. P. BUCKLEY, *Dental Register*.

**ILLEGAL PRACTITIONERS.**—A dentist of Riverside, Cal., a former president of the Illinois Board of Dental Examiners, was arrested recently and pleaded guilty of practicing dentistry without a license. He insisted that he did not know that he was doing wrong and produced a commission signed by the governor of Illinois showing that he was a member of the Illinois Board of Dental Examiners. He intends to vindicate himself by going before the California Board of Examiners.—A dentist of Los Angeles, Cal., charged with practicing dentistry without a license, was fined \$50 June 10.—Warrants were issued June 10 for the arrest of five dentists of San Francisco, charged with practicing without licenses.—Two dentists of Chicago were fined \$50 and costs each June 25 for practicing without a license.—A dentist of Washington, Ill., who paid a fine of \$50 and costs early in June after entering a plea of guilty of practicing without a license, was arrested again on the same charge June 20. He will contest this case, as he states that he is not in charge of the office, but has a licensed dentist in charge.—Much interest is centered in the numerous prosecutions against a dentist of Peoria, Ill. At the last term of the county court he was tried and found guilty of practicing without a license, and a fine was levied. The doctor has been a practicing dentist for a quarter of a century, and says he will fight the case to the last ditch.—A dentist of Baltimore, Md., charged with practicing without a license, was fined \$62 and costs May 28.—The officers of three concerns in Boston, which are held to be practicing dentistry in violation of the law passed this year, were convicted and fined \$50 each, and all of them appealed

and were held in \$200 each.—A dentist of Valentine, Neb., arrested June 4 for practicing without a license, was bound over to the district court under bond of \$500.—A dentist of Bowling Green, O., charged with practicing without a license, was fined \$100 and costs June 2.—A dentist of Providence, R. I., charged with practicing without a license, was fined \$50 and costs June 4. He appealed, giving surety in the sum of \$300.

**SIGMATISM OR LISPING.**—This defect has been pronounced to be due to faulty action of the tongue against the teeth, comprising various defects in the enunciation of the sibilant sounds.

One well-versed author rests his contention particularly on the pronunciation of *s*, *sh*, *z*, *zh*, etc., which form so large a part of the English language. Its most common form is that in which the sound *th* is used for *s*, and vice versa.

It is frequently affected, he claims, "by fools, but may be due to an abnormal condition of either the tongue or the teeth."

Considering the existing conditions, aside from what the author claims to be due to the abnormal development of the individual, it gives rise to fruitful importance for careful consideration in the construction of bridges.

Very frequently we see an excessive thickness of reinforcement by means of solder, at the linguoincisal aspect of anterior bridges, and it is therefore evident that a great deal of this evil could be prevented or remedied.—

BERNARD BRAMM, D.D.S., Chicago.

**EXAMINING BOARD AFFAIRS.**—The California state board of dental examiners June 13 officially rescinded its action of last April imposing a penalty of \$10 on all dentists who neglected to pay their annual license fee of \$2 by May first, and decided to refund the \$600 already collected in that manner. Misunderstandings which have arisen among the dentists since the ruling went into effect are given as the cause for withdrawing the penalty until next year.—Dr. C. A. Herrick, secretary of the California board, reports the arrest, during the past year, of forty-six persons charged with practicing dentistry without a license, the conviction of twenty, and the remaining cases pending.—At the June meeting of the California board 39 out of 56 candidates were successful in passing the examination.—At the June meeting of the Connecticut Board 21 out of 37 were successful in passing.—Governor Woodruff recently appointed Dr. Albert W. Crosby of New London a member of this board to succeed Dr. A. B. Johnson of New Britain.—At the May meeting of the Georgia Board 13 out of 20 candidates were successful in passing the examination.—The Governor of Kentucky recently appointed Dr. J. W. Black of Bowling Green a member of the board.—At the May meeting of the Louisiana Board 26 out of 38 candidates were successful in passing.—Governor Guild of Massachusetts has reappointed Dr. Thos. J. Barrett of Worcester a member of the board.—At the June meeting of the Oregon Board 37 out of 54 candidates were successful in passing the examination.—At the May meeting of the Washington Board 46 out of 77 can-

dicates were successful in passing the examination.—A registered and licensed dentist of Seattle, Wash., has brought suit in the superior court for \$5,250 damages against members of the state board, for false arrest.—A dentist of Everett, Wash., who failed to pass the recent test given by the Dental Examining Board at Tacoma, assaulted a member of that board in his office, June 5. He pleaded guilty to the offense and was fined \$20.—At the annual meeting of the Wisconsin State Board of Dental Examiners in June Dr. J. J. Wright of Milwaukee was elected president and Dr. F. A. Tate of Rice Lake as secretary to the board.

**LEGITIMATE ADVERTISING PROPER.**—There are legitimate and illegitimate ways of advertising. A man has a right, it seems to me, to advertise himself, that is, to become known. How would a young man ever build up a practice if he locked himself up and kept away from his fellow beings? It is right that a young professional man should gain acquaintances in legitimate ways. I do not mean that he should work clubs or churches, but he has a right in modest ways to gain the acquaintance of good people, who may become his patients. A man may advertise himself in the manner indicated, and be entirely ethical, and it is really the only method of advertising that is legitimate.—T. L. GILMER, *Dental Review*.

**ANATOMICAL ARTICULATORS.**—In the use of any one of these various anatomic articulators, we must not expect to be able to construct dentures for the edentulous mouth; and have them work in the mouth as they did in the articulator. Work as hard as we may to get the dentures as accurate as possible, I believe when we put them in the mouth we will still find work to do. The anatomic articulators are a closer approach to the mandibular movements than the plane line articulator, and therefore an improvement, and it is our duty to employ that which will insure better results than we could obtain by former methods. But we should never dismiss the patient until every possible movement in occlusion has been observed, and until we have obtained the three-point contact or diverging contact of the different surfaces which will prevent displacement.—H. J. GOSLEE, *Dental Review*.

**SWALLOWED TEETH; NEAR DEATH.**—John A. White, commercial instructor in the high school, Moline, Ill., is in the city, a shadow of his former robust self. Two years ago he swallowed a small plate and two teeth, and his friends were much relieved when, after several days, he appeared to have suffered no ill effects. Mr. White presumed the teeth were in his stomach, and he took no immediate steps toward medical relief, preferring to await developments. Several months ago he lost his voice, and doctors discovered, by using the X-ray, that the teeth were lodged in his esophagus. Mr. White was confined in a hospital while efforts were made to remove them. Three or four days after they had been located they dropped into the stomach, and all efforts to remove them have been

unavailing. Mr. White left the hospital May 7, weighing 129 pounds, where he formerly weighed 165. He has gained sixteen pounds in six weeks and is gradually recovering the use of his voice. He will spend much time in outdoor recreation, and when he has recovered his strength will submit to the knife to have the teeth removed.—*Rock Island Argus*.

**DENTISTS OF THE U. S. ARMY.**—The dentists of the United States army are anxious to be established as a department of the army with permanent locations. They are now hurried from America to the Philippines, to Panama, to Cuba, to Alaska and all parts of the United States on a moment's notice, and there is no apparent head to the dental service. Attorneys representing the dentists are now in Washington in consultation with congressmen and senators, endeavoring to secure legislation which will provide for a dental department having similar rules and regulations as now pertain to the medical department.—*Medical Fortnightly*.

**AUTHOR OF "DAVID HARUM" THE SON OF A DENTIST.**—We have heard paid to Dr. Westcott a just tribute of being the discoverer of cohesive gold. This discussion on the romance of dentistry brought to my mind the fact that the author of "David Harum," one of the best novels published, was the son of Dr. Westcott, of Syracuse, New York. Let us not forget that while we give Dr. Westcott due credit for having discovered the cohesiveness of gold, he is the father of one of the best novel writers we have ever had in this country. Young Westcott was a cashier in a bank; he wrote this book, and died of tuberculosis while it was in the hands of the printers. The settlement of the estate was kept open for a year or more, and the widow enjoyed over \$40,000 from the sales of this novel.—E. K. BLAIR, *Dental Review*.

**A HINT IN TAKING A BITE.**—In taking a bite for a full denture where the patient is wearing a full plate on the opposite jaw, a convenient way of doing so without unnecessary annoyance to the patient is to build the wax rim on the wax baseplate as usual, try the wax in the mouth and trim it to the proper form. Now, instead of building more wax on the rim to obtain the impression of the teeth on the plate, remove the wax baseplate and the denture from the mouth without disarranging them. This may be accomplished by sealing the wax to the teeth at two or more points, with a hot spatula, while the patient's jaws are closed in their correct relation. Take the case to the laboratory, place the model in position in the baseplate to hold it firmly, and flow melted wax around the occlusal surfaces and the cutting edges of the teeth on the plate. This will produce the desired impression on the wax, and the correctness of the bite may be verified by removing the plate from the wax, placing the wax baseplate and the denture in the mouth and have the patient close the jaws. There are various advantages in this method which will become apparent to any practitioner who adopts it, without any further explanation.—G. W. JOHNSON, *Dental Review*.

MARRIAGES.—A. E. Kline, a dentist of Marysville, Cal., was married to Miss Julia Boyd of Napa, June 10.—Leo M. Linscott, a dentist of Santa Cruz, Cal., was married to Miss Ruby M. Lewis of Santa Cruz, June 18.—R. L. Graber, a dentist of Peoria, Ill., was married to Miss Grace Roszell, also of Peoria, June 24.—Edmund J. Kelly, a dentist of Chatsworth, Ill., was married to Miss Mary F. Kueffner of Aurora, June 22.—O. H. Meyers, a dentist of Ft. Wayne, Ind., was married to Miss Sadie Beiter of Ft. Wayne, June 18.—Glen W. Miller, a dentist of Marshalltown, Ia., was married to Miss Ethel Atkinson of St. Anthony, June 24.—Ansel Settell, a dentist of Bloomfield, Neb., was married to Miss Bertha Leigh of Bloomfield, June 24.—Isaac G. Rosenberg, a dentist of Boston, was married to Miss Jennie Lewis of Lewiston, Me., June 23.—J. Edwin Hazleton, a dentist of Bangor, Me., was married to Miss Lena Bean of Bangor, June 11.—Walter L. Stevens, a dentist of West Somerville, Mass., was married to Miss Johanna R. Nahrung, also a dentist of West Somerville, June 20.—Walter G. Dunham, a dentist of Albion, Mich., was married to Miss Mildred Andress of Albion, June 25.—Rudolph Gilkey, a dentist of Kalamazoo, Mich., was married to Miss Helen Kauffer of Kalamazoo, June 10.—J. L. Frederick, a dentist of Brainard, Minn., was married to Miss Katherine Walker, also of Brainard, May 27.—Leopold A. Ellenburg, a dentist of St. Louis, Mo., was married to Miss Sadie T. Cohn of Collinsville, Ill., June 16.—O. E. Heins, a dentist of Maysville, Mo., was married to Miss Grace Brown, also of Maysville, June 14.—Frank H. Criley, a dentist of Independence, Mo., was married to Miss Elizabeth Shale of Independence, in June.—Victor McKee, a dentist of Sapulpa, Okla., was married to Miss Minnie Dougherty of Marysville, Kan., June 2.—Arthur Musgrave, a dentist of Carrollton, Mo., was married to Miss Muriel Standley of Carrollton, June 3.—Frank B. Dameron, a dentist of Lincoln, Neb., was married to Miss Sally Agnew of Los Angeles, Cal., June 3.—Elmer E. Meyers, a dentist of Humboldt, Neb., was married to Miss Bertha Frank of Humboldt, June 19.—N. T. Benz, a dentist of Syracuse, N. Y., was married to Miss Eva M. Born of Syracuse, June 4.—A. C. Hitzelberger, a dentist of Utica, N. Y., was married to Miss Mary E. Rhubarb, also of Utica, June 3.—Guy H. Cole, a dentist of Watertown, N. Y., was married to Miss Nina E. Van Duze of Watertown, June 17.—David J. Vedder, a dentist of Utica, was married to Miss May Jarvis of Little Falls, July 10.—John J. Werner, a dentist of Batavia, O., was married to Miss Carpenter of London, Ont., June 23.—Walter W. Gill, a dentist of Corning, Ia., was married to Miss Mary C. Dunham of Alloway, Pa., June 17.—C. A. James, a dentist of Spokane, Wash., was married to Miss Helen Stevens, also of Spokane, June 10.—William T. Maynard, a dentist of Milwaukee, Wis., was married to Miss Josephine F. Mertz of Milwaukee, June 10.—Charles G. Lee, of San Francisco, the first native-born Chinese to be admitted to practice in the state of California, was married to Miss Clare E. Chan, the daughter of a Chinese minister, also of San Francisco, June 25.